

MILITARY MEDICINE

ORIGINAL ARTICLES

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PRESIDENTIAL ADDRESS*

Professional Excellence—The Criterion of Military Medicine

By

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IN VIEW of the fact that we are this year stressing professional competence in military medicine, and also in view of the fact that this is a National Guard year, I would like to point out that this Association was founded by a National Guardsman, Nicholas Senn, who long before, had gained great professional competence both in civil and military medicine. He had become the distinguished Professor of Surgery at the Rush Medical College in Chicago. He was a highly trained scientific surgeon who had made many contributions to surgery before he founded this Association. He made valuable experimental contributions to the study of air embolism, surgery of the pancreas, gunshot wounds, and intestinal anastomosis. In the last named condition, he introduced the use of decalcified bone-plates, which were the precursors of the old Murphy button. He also devised a method of detecting intestinal perforation by means of inflation with hydrogen gas. All of this work was done before our Association was founded. Later he played an important part in the Spanish-American War. Later still, in

1903, he was the first to use roentgen rays in the treatment of leukemia.

It would seem, then, that we were the inheritors of professional excellence; did we not know that such qualities are not transmitted through the genes, but have to be strived for and attained anew by each succeeding generation?

For many years National Guard officers, probably due to the persisting and pervading influence of Nicholas Senn, played a large part in the affairs of this Association. I am sorry to say that that participation has been somewhat on the wane since World War II. An effort has been made during the present Administration to rectify this.

I am not unaware of certain prejudices which exist in this country against the National Guard. Undoubtedly, as in any other large organization, there are some good and some bad units. No organization so large could be of uniformly high quality throughout the country. I cannot resist the temptation, however, to tell you that the National Guard organization with which I was so long associated before the last war—the old 110th Field Artillery Regiment—was one of the finest organizations I have ever seen, either in civil or military life.

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As somewhat of a newcomer to Baltimore, I was asked in 1923 to become the Regimental Surgeon of that regiment. The roster of the officers read like a Who's Who in Baltimore. As a young surgeon just starting out, I had plenty of time, so accepted the offer with alacrity, for two reasons. In the first place, I liked military life; and, in the second place, the officers of the regiment were the kind of people I wanted to be associated with. Baltimore is a great Princeton town and almost all the officers of the regiment from the colonel to the youngest second lieutenant had been through the Princeton Artillery R.O.T.C. They were all, also, fine outstanding citizens who were leaders in Baltimore in every way. The regiment had a marvelous esprit, wonderful discipline, and was highly efficient both in gunnery and sanitation. (I saw to the latter.)

As the line officers of the regiment were of such high caliber, I felt it my duty to see that the young doctors brought in were of the same quality. Of the eight doctors I drew into the regiment as battalion surgeons during my seventeen year tour as Regimental Surgeon, four attained national or international reputations. (The service was popular so there was always a waiting list.) My first two battalion surgeons—Albert Key and Lawson Wilkins—were classmates and old friends of mine in the Johns Hopkins Medical School. J. Albert Key, as every surgeon knows, moved to St. Louis, where he became Professor of Orthopedic Surgery in Washington University and one of the world's outstanding orthopedists. Lawson Wilkins is now Professor of Pediatrics in the Johns Hopkins Medical School and is probably the world's leading authority in pediatric endocrinology. E. Cowles Andrus, of Baltimore, is one of our country's leading cardiologists and was recently President of the American Heart Association. Herbert F. Traut is now Professor of Gynecology and Obstetrics at the University of California. The other four became leaders in their respective specialties, three in Baltimore and one in Houston, Texas. At the same time

that such men as these were serving as battalion surgeons in the 110th Field Artillery, men like William D. Stroud and John R. Paul, of Philadelphia, were serving as battalion surgeons with the 108th Field Artillery, with whom we used to be in camp in the summertime. Bill Stroud, as you know, is one of the country's outstanding cardiologists and is on the program for this meeting. Johnnie Paul, an old friend, who was one year after me at Hopkins, is now Professor of Preventive Medicine at Yale. Such are some of the medical men who have proudly served in the National Guard. In going over the roster of the present day National Guard colonels (there was not time to go over the entire list), I found a good many who were highly qualified professionally and who were leaders in their respective communities.

Recently there have been unfortunate attempts to de-emphasize the National Guard. There are a good many National Guard leaders who feel that the attempts are not only to de-emphasize the Guard, but actually to destroy it. They feel that the recent Federal requirement of six months basic training for every National Guard recruit is the first step in that direction. It must be remembered that National Guard recruiting is on a volunteer basis and that the most desirable people, such as we used to get in my old regiment, would not join as youngsters if they had to have their education interfered with to such an extent. Many of them would enlist if they were allowed to take the six months training three months at a time in successive summers. The even more recent curtailment in the strength of the National Guard seems another step in the wrong direction.

I am in favor of universal military training but think it should be based on the Swiss system. To give a man six months active duty training and then let him hibernate in a Reserve unit thereafter seems to me to be futile. The Swiss Army is generally credited as being very efficient. As I remember their system from studying it firsthand a few years

ago, is something like this: All males from 20 to 60 serve. The first year of service is 17 weeks as a minimum (for infantry) and more for other services, such as artillery. After that, each man serves three weeks a year until he is 32; then three weeks every two years until he is 42. There is a final three weeks period at 47. However, they are not let out until they are 60 and everyone from 20 to 60 must keep his equipment in order. This is inspected each year and they are responsible for keeping it intact. They are fined if they do not meet a certain standard of marksmanship. There are target ranges all over the country. They may shoot any time they want to and all are good shots. There are many mountain fortresses. Anyone planning to attack Switzerland should think twice. Our present National Guard setup would make a fine basis upon which to form a system similar to that of the Swiss.

I need not tell you that the roots of the Guard go deep into the soil of practically every community of our nation. The institution which we know as the Organized Militia, or the National Guard, was brought to our shores by our forefathers who left England to make new homes in what was then known as the New World. In those days every individual was charged with the responsibility of assisting in the defense of his home, and, further, each individual learned to shoot well in order to provide food for the family. My first ancestor in this country, an Englishman, was a captain in the Virginia Militia, fought in many battles with the Indians, was once captured by them and almost killed, but was rescued by the ruse of another captain. (This, I might say parenthetically, was long before the Mayflower was ever heard of. And does it not seem a little strange that this, the 350th anniversary year of the founding of Jamestown, should be selected for the voyage of Mayflower II?) It was the Militia of Massachusetts who repulsed the British Regulars at Concord. It was the Maryland Line which saved General Washington's Army at the Battle of Long Island.

But the present National Guard is far superior to the old State Militia. It is now Federally paid, Federally trained, and periodically inspected and examined by regular officers other than the assigned instructors. Federal recognition, and pay, are withdrawn if any unit fails to meet the required standards. The new National Guard has produced divisions which served as well as any in World Wars I and II, such for example (to mention only a few), as the Rainbow (42nd) and Yankee (26th) Divisions in World War I and the 29th and 37th Divisions in World War II. The National Guard has become part of our first line of defense. It would be a mistake to curtail it or to de-emphasize it in any way.

I trust that those who feel that there are influences in our government who, to say the least, do not look with favor upon the National Guard, are entirely wrong. Certainly it seems clear that everything should be done to foster and strengthen this old historic and proven valuable part of our Service. Could it be that the Federal Government is jealous of the partial State control of the National Guard? For more than two decades now there has been a decided trend in this country toward concentrating all power in Washington. This, I believe, is wrong and is entirely contrary to the concepts upon which this country was founded. If carried to the extreme, it would lead to totalitarianism. I would like to quote a statement made by the President of the United States, our Commander-in-Chief, on October 10, 1956. It is as follows:

"The dual status of the National Guard, whereby it serves the States in time of peace and the Republic in time of national emergency exemplifies that sound, traditional relationship between the States and the Federal Government, unique in our governmental system. This historic concept should be ever strengthened, never weakened."

Notwithstanding the above statement and the further statement to the effect that the President desired the National Guard to be stronger and better, we find that those individuals in the Department of Defense

charged with the responsibility of the preparation of the Budget have failed to provide the necessary funds with which to maintain the strength of the National Guard, and, at the same time, provide for the six months basic training which they insist a young guardsman must take. During the hearings before the House Subcommittee on Army Appropriations, which took place in the Capitol April 17 to 19, 1957, it was urged and recommended by the officials of the National Guard that the year-end strength of the Army National Guard for June 30, 1958 should be fixed at 425,000 and that funds be provided for at least 50,000 six months trainees. Notwithstanding this fact the Budget for '58 as it passed Congress provides for a strength of only 400,000 and for the training of only 5,000 young trainees in the six months program. If the requirement that each young man who volunteers to join the National Guard must take six months basic training is to remain in effect, it will be possible in this fiscal year to enlist only 5,000 young men under 18½ years of age. Here we see for the first time in the history of our nation the absurd condition wherein the young men of the nation are precluded from volunteering for Military service in this historic organization. It is estimated that the probable maximum number of prior servicemen who might enlist in the National Guard is only 36,000 per year. The net result of this action on the part of the Budget, the Department of Defense, and Congress is easily understandable. There can be only one result, that the strength of the Army National Guard, during the fiscal year 1958, will be materially reduced and may fall as low as 350,000 or even less. It now appears that there has been a radical change of sentiment on the part of the Department of Defense with respect to the strength and training of the Army National Guard as well as the Army Reserve and it is quite apparent that the fiscal and military policies of the administration are not in consonance.

With this statement I rest my case for

the National Guard.

As a civilian soldier, not on active duty, I have been able to say things that I very properly would not be able to say were I on active duty. Whether I have been right or wrong in voicing these opinions, it is still a part of our American way of life, the way of life which I have always lived, and which I shall continue to follow until the end.

Now to return to our theme—professional excellence. First, a little of the historic background. There have always been good doctors in the Regular Service. No one can ever forget the monumental work of Beaumont with the gastric fistula he chanced upon in the halfbreed Indian, Alexis St. Martin. Pasteur once said that "In the field of observation, chance favors only the mind that is prepared." It was fortunate for medicine that William Beaumont had that prepared mind. Again, referring to the fine doctors in the Regular Service, one immediately thinks of the monumental work of Walter Reed, Gorgas, Sternberg and Stitt to mention only a few.

Having been on active duty in the Army during both World Wars and in one of the Reserve components during almost all of the rest of the time, having been Surgical Consultant for the Surgeon General of the Army and for the Surgeon of the Second Army ever since World War II, and having worked in close liaison with the Navy in the Pacific during World War II, I feel that I am in a rather unique position to speak about the professional competence of the doctors in our Regular Services. I, of course, am more qualified to speak of the Army, having known intimately many of its officers in the Regular Service since 1917 and having observed the work of many others, both at home and abroad, over a long period of years. While the Army has always had good doctors, as I said before, the percentage of good ones during the early years of my contact with it was small. Stress in the early years of my contacts was laid on service schools rather than on professional competence. At the Cleveland meeting of this As-

sociation in 1940, Leon Fox, then a Major, now a retired Brigadier General, made an impassioned plea for professional competence. Among many other things, he said that he wished that the man who said "Forget you are a doctor, you are an Army officer" might toast in hell. An ex-Surgeon General of the Army, who was listening to his address, took him to task afterwards, claiming that that had never been the attitude of the Medical Department. Fox took the General by the arm and gently led him into the Exhibit Room, where in huge letters was displayed the following statement from General Munson (designer of the Munson shoe) with regard to the function of the medical officer. The statement read: "First a soldier, second a sanitarian, and third a surgeon."

One of my best friends in the Regular Service, now a retired Major General, went through all the important schools between the two wars, including the Medical Field Service School, the Field and Staff School at Fort Leavenworth, the Industrial College and the War College. He was always an able administrator but during his whole career did very little clinical work. After World War II he told me that, until his experience in that war, he had always felt that the primary duty of the medical officer was to be a soldier. He said that his experiences in World War II had changed his point of view completely and that he then felt that the primary duty of every medical officer was to be a good doctor. That was a very healthy change in attitude. That change, according to my observation, has become pretty universal. I believe that World War II gave it its impetus.

The Consulting program, so wisely adopted by the Medical Departments of the Armed Forces after World War II, has had a very beneficial effect both in military and civilian medicine. The advance in professional competence has been amazing. I was surprised and delighted a few months ago when General Sam Seeley, Chief of Professional Services in the Office of the Sur-

geon General, told me that 92% of the Regular Army medical officers are now either Board qualified or Board certified. That is a proud and triumphant record!

With such a staff of highly qualified personnel there will no longer be any question but that the supreme function of the Medical Corps of the Army is to take care of Army personnel professionally. Of course it goes without saying that the Officers of the Corps have to be soldiers and sanitarians also, but that is not their primary function. This will mean that gone are the days when a man who is not qualified professionally will be put into administrative work and promoted in order to get him out of professional work. That, we all know, has happened too many times to the detriment and discouragement of professionally highly qualified military doctors. Of course there must be administrative positions in the Medical Corps, but we have all seen the best doctors make the best administrators. I believe that the time will come when, if a man is not a good doctor, he will be dropped from the Service rather than being put into administrative work where he may well be promoted over his fellows who are highly qualified professionally. I would like to see the day when certain minimal standards of professional attainment would be set up for the advancement to general officer or flag grade. Then no one could complain if a man who had these requirements and also exceptional executive ability were advanced over his fellows, who had outstanding professional qualities but who did not possess administrative qualifications.

I have been a member of the American Medical Association all of my professional life, have a high appreciation for the fine work that organization has done, and am one of its staunchest supporters. However, that does not mean that I must necessarily accept all the dicta laid down by the A.M.A. I am glad that the Medical Departments of the Armed Forces did not succumb to A.M.A. pressures to abandon dependent care. Such a program would be bad for

the professional competence of the military doctor. Were it not for dependent care, medical officers in all specialties would have their practice and experience limited to the care of adult male patients. Even in a general surgeon this would be undesirable. It would be equally undesirable in an internist. It would leave no scope whatsoever for gynecologists, obstetricians, and pediatricians. Such a limited field of experience would be discouraging to the military doctor, and hamper him in becoming an integral part of the medical profession, in which it goes without saying that he should play a very active role. The new Medicare Program for dependents will put the military doctor in competition with the civilian doctor. When this program was in process of formation, I represented Maryland at the Chicago organizational meeting. The question was discussed as to whether dependents on military posts, where there were hospitals, should be compelled to have their medical care at the post hospital or whether they would have free civilian choice. General Hays, who purposely did not enter into the discussion because he did not want to influence the meeting, told me privately that he would like to see dependents have free choice because that would put his doctors in competition with civilian doctors, which he thought would be a fine thing. That showed a wonderful spirit and one worthy of the best traditions of our profession. My only comment is "All hail!"

No observant person could have lived through the last seventeen years without realizing that in the troubled world in which we live there can be no sharp distinction between the civil and the military doctor. Most doctors have been in the military service, and those who have not, will probably be sooner or later. No man, with any judgment, will question the fact that we must

have adequate defense forces now, and possibly for a long time to come. An essential part of those defense forces is the military doctor—a component part of the medical profession, and one that cannot be divorced from it. Military medicine belongs to our entire population, is a necessary part of our defense effort, and every doctor, whether in uniform or out, should not only take pride in it, but should feel his full share of responsibility for it. The Army is our Army. The Armed Forces are our Armed Forces. The doctors in the Armed Forces are a part of us. Doctors for many years to come will be slipping in and out of uniform as occasion demands. If the use of consultants in the Armed Forces since World War II has been good for the Armed Forces, it has also been good for the consultants, and I believe for the profession as a whole. We now have a Section on Military Medicine in the American Medical Association. I strongly believe that every possible effort should be made to foster the contacts between the military and civilian doctor, to consolidate their interests, to increase the feeling of brotherhood between them, to ripen their friendships, and in every way to make them feel as one.

In conclusion, permit me to say that my contacts with the various components of the Armed Forces, though not without their trying moments, have on the whole been felicitous, highly beneficial, and have brought me some of my finest and most steadfast friendships. As one who loves the Service, I have always felt free to criticize certain aspects of it, but the criticism has always been in the spirit of family criticism, and has come from one who wants to see our Services the world's best.

1014 St. Paul St.,
Baltimore, Md.

Our New President

THE President of the Association of Military Surgeons of the United States is a former Colonel of the Medical Corps of the United States Army. Now retired (since 1951) Dr. Charles R. Mueller remains active in the medical pro-



DR. CHARLES R. MUELLER
(Colonel U. S. Army, Ret.)

fession. He is Director of Medical Service in the Veterans Administration's Department of Medicine and Surgery, Washington, D.C.

A native of Michigan, Dr. Mueller re-

ceived his medical degree from the Detroit College of Medicine and Surgery (now Wayne University) in 1916. He entered the Army in 1917 and served continuously until his retirement in 1951 when he joined the Veterans Administration's staff in Washington.

Dr. Mueller has had several tours of duty at Walter Reed Army Hospital. His last duty assignment at that hospital was that of the Chief of Medical Service. During World War II he successively filled the position of Chief of the Medical Service at Lovell General Hospital, Commanding Officer of the 16th Hospital Center at Brownwood, Texas, Post Surgeon at Camp Gruver, Oklahoma, Surgeon of the Northwest Service Command, and Surgeon of the Seventh Service Command.

He is a diplomate of the American Board of Internal Medicine, a member of the American Medical Association, American College of Physicians, and the District of Columbia Rheumatism Society.

Dr. Mueller brings to the Association's office of President high professional and military abilities.



The New York Chapter of the Association of Military Surgeons held its annual meeting on November 21, 1957, at the Officers' Club at Governors Island, New York. The chapter was honored to have as its guest speaker Colonel (now Brig. Gen.) Amos R. Koontz, MC, NG, Maryland, who was the 1957 president of the Association. He gave an interesting talk on "Pills, Politics and People."

The following officers were elected: President, John N. Bowden, Med. Dir., USPHS; 1st Vice-President, Col. James Q. Simmons, Jr., MC, USA; 2nd Vice-President, Col. Wilbur Smith, MC, USAFR (MC); Secretary, Capt. Samuel Candel, MC, USNR; Treasurer, Col. Francis N. Kimball, USAF(MC), Ret.

National Guard Opportunities for Members of the Health Professions

By

COLONEL ARCHIBALD LAIRD,
83rd Medical Group, Pennsylvania National Guard

NATIONAL GUARD opportunities for members of the health professions include guidance and leadership, teaching, administration, personnel management, indoctrination in the traditions of military art and science, self-improvement in professional skills, and security for the future. These opportunities apply regardless of the military occupational specialty assigned. They are not limited to staff positions nor to purely professional team appointments.

Members of the professions realize how the present trend of specialization increasingly limits the field of interest. National Guard affiliation whether it be in a medical detachment, medical company, battalion, group, or hospital broadens one's perspective and is rewarding. While so-called choice professional assignments are distinctly limited, if one considers the esoteric values over a long period, National Guard service cannot be equalled. To be part of that service, one must be sound mentally, emotionally and physically. Standards are such that one is encouraged to maintain bodily fitness. And if one is to be advanced, further military knowledge is required.

Opportunities for leadership exist regardless of the size of the organization. No matter what the assignment, leadership traits can be developed, military psychology learned and psychoneuroses identified. There is no better field for encouraging capable young men to study medicine, dentistry and the related professions than among those who fill the ranks of a National Guard Unit. At least one university in Pennsylvania has a National Guard scholarship in its undergraduate schools and a National Guard scholarship fund in its school of medicine.

These financial aids for advanced education add a new dignity to National Guard service.

Planning training schedules and teaching subordinates the fundamentals of instruction in health services are just as important in the lower echelons of medical service as they are in the higher. In either instance, the imparting of knowledge to members of one's unit is in keeping with the traditions of the learned professions.

Managing affairs and people are part of the routine of every professional office. A delightful way to get accustomed to the wartime demands of "paper work" is through National Guard training as a medical, dental or medical service corps officer. Planning, organizing, directing the proper utilization of manpower can be practiced in any assignment.

Military Medicine has had a long and brilliant record. National Guard Service gives one an opportunity to learn not only the significant advances in the healing arts as a result of the research and observation by physicians in the Armed Forces, but also to learn the historical role military hospitals have played since the time of the American Revolution.

Opportunity for self-improvement in professional skills is unlimited. Extension courses in hospital administration and aviation medicine are without equal for practical information related to the civilian practice of medicine. The same is true of the various courses in sanitation, preventive medicine and administrative law.

Post-graduate short courses for Medical Corps Officers have no civilian counterpart at any price. The matchless instruction given in nuclear chemistry, surgery, internal medicine, pathology, psychiatry, neurology

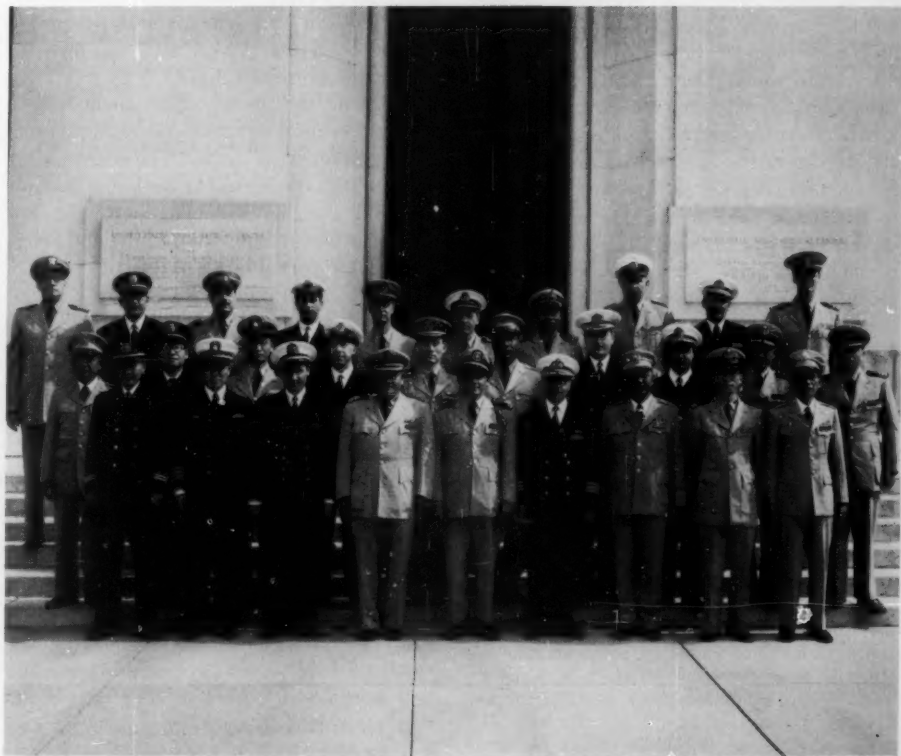
and the like, keep the National Guard medical officer abreast of developments whether he is a general practitioner or a certified specialist. For the dental officer there are courses in oral surgery, oral pathology, oral diagnosis. Medical service personnel may receive instruction in the management of mass casualties, laboratory procedures and sanitation. Open to all are refresher courses for company and field grade officers which cover a variety of subjects.

Not the least of the National Guard opportunities for members of the health professions is security for the future. Retirement pension benefits amount to a substan-

tial income for one's later years. And with the privilege of Social Security extended to Doctors of Medicine who are active in the National Guard, years of retirement can be faced with less concern.

When we look back to pre-World War II days of the National Guard we find that professional men came into the ranks motivated only by a spirit of service and a natural inclination for military life. Today they can come in motivated by the same spirit of service but with professional opportunities unheard of even a decade ago.

Wellsboro, Pa.



Official U. S. Navy Photo

Graduates of a course in Military Medicine for foreign medical officers held at the National Naval Medical Center, Bethesda, Maryland, September 16-November 3, 1957.

THE 1957 WELLCOME PRIZE ESSAY EPENDYMOMA OF THE CAUDA EQUINA

A Report of the Clinicopathologic Aspects and Follow-up Studies of Eighteen Cases

By

CAPTAIN WILLIAM W. AYRES, MC, U. S. Navy*

(With 24 illustrations)

THE purpose of this paper is to report the clinical and pathologic aspects of 18 cases of intradural extramedullary ependymoma located in the region of the cauda equina, filum terminale, or conus medullaris. These neoplasms offer considerable difficulty in clinical diagnosis because of their variable clinical features; erroneous diagnoses include: herniated intervertebral disc, brain tumor, genito-urinary tract disease, sacro-iliac sprain, sciatica, and progressive neuropathic atrophy. As a result, diagnosis and operative excision of the neoplasm is sometimes delayed and irreparable damage to the spinal cord occurs. Difficulty is also encountered in pathologic diagnosis, the neoplasm having been mistaken for angioglioma, glomus tumor, angiomatous meningioma, hemangiopericytoma, protoplasmic astrocytoma, endothelioma, endothelial sarcoma, astrocytoma, medullo-epithelioma and particularly hemangioma and hemangioblastoma

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The presentation of the Sir Henry Wellcome Medal and Prize was made at the Honors Night Dinner held October 30, 1957 during the 64th Annual Convention of the Association of Military Surgeons of the United States.

because of their extreme vascularity. It is hoped that a detailed study of this large series of cases from the Armed Forces Institute of Pathology, here reported, may resolve at least some of these difficulties.

Follow-up studies on 18 cases are presented and we have been able to correlate histologic type of ependymoma with prognosis. Four of the 18 cases were fatal and three of these are reported in detail.

Including this series, approximately 107 cases of ependymoma of the cauda equina have been reported in the literature.¹⁻³² Most of these are single case reports, but Kernohan and Fletcher-Kernohan,¹¹ Rasmussen, Kernohan and Adson,¹⁴ and Lüthy and Irsigler²⁷ have reported large series.

The following tables are given:

Table I—Ependymoma of the Cauda Equina. Clinicopathologic Aspects.

Table II—Ependymoma of Cauda Equina. Clinicopathologic Correlation.

Table III—Differential Diagnostic Symptomatology Between Ependymoma of the Cauda Equina and Conus Medullaris.

Table IV—Ependymoma of Cauda Equina. Follow-up Studies.

Table V—Bibliography of Published Cases of Ependymoma of Cauda Equina.¹⁻³²

CLINICAL FINDINGS

SYMPTOMATOLOGY. Midline *low back pain* was the most characteristic symptom and was present in all 18 patients. This pain was located in the lumbar region, varied in intensity in different patients from a feeling of

discomfort to intolerable pain only partially relieved by narcotics. Rarely, the pain was located in the hip. The pain was constant in most cases, intermittent in a few. It was not unusual for a patient to have an initial attack of low back pain followed by a pain-free interval of several months, recurrence of pain, and subsequent progression of symptoms leading to paraplegia. Activity which increased intra-abdominal and cerebrospinal fluid pressure, as coughing, sneezing, straining at stool, or lifting heavy objects, intensified pain. Any bodily movement which placed tension on the cauda equina, as bending over, attempts to get out of a chair, going up or down steps, straight leg raising, flexing the neck, and extension of the neck, aggravated the pain. Some of the patients took only careful short steps to prevent intensification of back pain. Lying down often made the pain worse, and standing up often relieved the pain. The pain was sometimes worse at night, requiring the patient to get out of bed and walk around to obtain relief. Some patients complained of weakness of one or both extremities while others noted weakness only when the pain was most severe. In a few patients, particularly early in the disease or between episodes of back pain, pain occurred only on coughing or sneezing.

A characteristic feature, present in almost all the cases, was *radiation* of the back pain along the course of the sciatic nerve, down the posterior aspect of the thigh and hip, and infrequently below the knees. Although the pain at first radiated down only one extremity, both extremities were involved in almost all patients within a few days. In one case the pain radiated to the anterior aspect of the thigh. In the majority of cases radiating back pain had an insidious onset, and increased in severity over a period of weeks to months. However, in 5 of 18 patients there was sudden onset of radiating back pain following trauma; the circumstances are as follows: Case 1; A patient strained his back while lifting a heavy tile. Seven days later he developed severe dull aching pain in the lower back radiating down the

posterior aspect of the right thigh and leg sufficiently severe to prevent walking. Case 3; A patient, while trying to drag 5 cases of milk, felt a "snap" in his back followed by intense persistent pain in the lumbar region which radiated to all the posterior aspect of both thighs. Case 5; A patient jumped down about 5 steps without apparent injury. The next day he awoke with pain in the lumbosacral region which radiated upward along the spine and downward into both legs. A week later he had severe throbbing headache, and a day later nuchal rigidity and vomiting. A spinal tap revealed xanthochromic bloody fluid. The symptoms were caused by an ependymoma of the cauda equina which hemorrhaged into the subarachnoid space, possibly the result of trauma. Case 6; The patient was in an automobile, which was struck from behind. The impact caused forced hyperextension followed, presumably, by rebound flexion of the neck. Soreness of the neck was immediate. About 1½ months later he experienced aching pain in the coccyx when seated, and later, pain in the left leg, aggravated by coughing and sneezing. Case 14; A patient while getting out of his automobile was struck in the lumbar spinal area by the door. Immediate persistent low back pain occurred which, a week later, radiated down the right leg along the distribution of the sciatic nerve, and a few days later, along the left sciatic nerve. Trauma appears to be a significant factor in the precipitation of symptoms since it was closely related to the onset of symptoms in 28% of the cases. Trauma may cause hemorrhage from the neoplasm, as presumably occurred in Case 5, or stretching of a cauda equina may cause the neoplasm to rearrange itself in the sacral sac so as to place pressure on nerve roots. The lag period between trauma and the occurrence of symptoms speaks more strongly for hemorrhage than for change in position of the neoplasm.

Worth emphasis is that radiating low back pain may be the only symptom and a neurological examination may be completely negative, or at most, offer a few equivocal dif-

ferences in the deep tendon reflexes of the extremities.

Paresthesias in the form of "shooting" or "electric shock" or "burning" sensations were present in the lower extremities in 4 cases. Acute flexion of the neck caused pain in the back and "shooting" pains in both extremities in one case.

Numbness, coldness, and swelling of the lower extremities, usually below the knees, were present in a few of the patients. Transient numbness in the extremities may follow an exacerbation of radiating back pain. One patient complained of numbness of the perineum.

Constipation and obstipation were significant symptoms and sometimes the only ones other than radiating low back pain. Several patients complained of constipation, which for many years required special dieting and numerous enemas for relief. Constipation was usually associated with urinary bladder dysfunction.

Five of the patients complained of *urinary bladder dysfunction* such as dribbling of urine, delay in starting the urinary stream, distention of the bladder, urgency, frequency, and involuntary emptying of the bladder. One patient said, "Feels like water is pent up and bursting to get out."

None of the patients complained of sexual dysfunction or loss of vision, symptoms occasionally reported in patients with ependymoma of the cauda equina.

PHYSICAL FINDINGS. Tenderness on palpation or percussion of the lumbar area of slight to severe degree was present in about one-half of the cases. Pressure over the lumbosacral area may cause pain to radiate to the buttocks and to the legs in the distribution of the sciatic nerve. Tenderness of the sciatic nerve was a frequent finding. Spasm of the paravertebral muscles in the lumbosacral area was present in 4 cases. Movement of the back was restricted because of spasm of the paravertebral muscles and because flexion of the back produced tension on the cauda equina with consequent pain. Both flexion and extension of the

back caused pain in two cases.

Straight leg raising, while the patient was lying on his back was limited in most cases (Lasèque's sign, normal 70 degrees). Limitation of straight leg raising was more marked on the affected side and sometimes restricted to 35 degrees.

Sensory disturbances were absent in about one-half of the cases. In the remaining cases the most common sensory disturbance was anesthesia or hypoesthesia below the knees. "Saddle anesthesia," an important diagnostic sign, was elicited in only two of the cases; it should always be sought for, particularly in the perianal area. An area of hyperesthesia was present on the lateral aspect of the leg in one patient and hyperesthesia of the saddle area in another patient. Analgesic areas were occasionally found.

The *deep tendon reflexes* of the lower extremities were variable. Early in the disease, with irritation of the motor roots, they were hyperactive. Later, with more extensive involvement, the Achilles, patellar and plantar reflexes were hypoactive or lost; the reflexes were usually asymmetrical because of more involvement by the neoplasm on one side than the other. Occasionally, the Achilles reflexes were absent and the patellar reflexes were retained or hyperactive. Of course, when atrophic flaccid paralysis ensued, the paralysis was of the peripheral type and all reflexes were lost. In a few of the cases the plantar reflex was of the extensor type (positive Babinski sign), and indicated involvement of the conus medullaris. The changes in the deep tendon reflexes may be subtle, and the only finding other than radiating low back pain. The cremasteric reflex may be absent on one or both sides. In two of the cases two-point sensation and vibratory sensation in the lower extremities was diminished.

Examination of the motor system of the lower extremities often revealed weakness, usually more marked on the side of severest radiating pain. In a few cases weakness of the extremities was present only during an attack of low back pain. In others, the weak-

ness was persistent and, in 5 cases, was followed by *flaccid paralysis* of one or both extremities. The paralysis occasionally began in the feet and then involved the entire extremity; or the paralysis in some cases was limited to the musculature below the knee. Paralysis, in some cases, occurred within two to three weeks after onset of back pain, while in others, progressive paralysis appeared months to years after the onset of symptoms. Several observers remarked on the extreme flabbiness of the calf muscles. Irritation of neurones of the anterior columns, as evidenced by "jerking" of the lower extremities, occurred in one case.

Neurological examination of the body, other than the lower extremities, was negative except in one case in which there were ocular pareses, and motor and sensory disturbances of the upper extremities. Involvement of the upper extremities was of ominous import and indicated spread of the neoplasm in the subarachnoid space, from the lumbosacral region to the cervicothoracic region.

It is desirable at this point to emphasize that neurological findings on examination of the lower extremities may be negative or there may be complete atrophic flaccid paralysis, with loss of deep tendon reflexes, and complete loss of sensation, associated with rectal and urinary bladder paralysis, dependent upon duration of the symptoms and the pathologic type and location of the neoplasm.

The chronology in the development of symptoms is important diagnostically and is illustrated by Case 16:

Days of Illness Symptomatology

1-4	Persistent low back pain radiating to right hip.
5-150	Asymptomatic except for pain in right hip and posterior thigh on coughing and sneezing.
151	Recurrence of persistent low back pain radiating to right hip and down right thigh posteriorly.
153	Weakness of right foot.

156

160

165

166-182

183

184-218

219-253

Two years
after onset

Pain and weakness of left lower extremity. Difficulty in starting urinary stream. Constipation.

Paralysis of feet.

Flaccid paralysis of lower extremities below knees. Hypoalgesia of dermatome of L 3 inferiorly. Absent Achilles, patellar and plantar reflexes, bilaterally. Cremasteric reflexes absent. (Laminectomy with excision of ependymoma of cauda equina).

Convalescence. Able to walk by himself. Almost complete return of sensory functions. Bladder and rectal functions regained. Evidence of return of muscular function, first in left foot and later in both feet.

Discharged. Left leg normal. Right leg residual paralysis of dorsiflexor of ankle, extensor of toes, and gluteus medius.

Convalescing at home.

Deep x-ray therapy.

Follow-up. Patient alive and asymptomatic.

The patients were all adults with an age distribution according to decades as follows: Second decade—1; third decade—3; fourth decade—7; fifth decade—3; sixth decade—2; seventh decade—2. The youngest patient was 20 years of age, the oldest 65, with an average age of 39. Twelve of the patients were males and 6 were females. Ten of the patients were military personnel and 8 were civilians. There were 17 Caucasians and one Negro (See Table I).

SPINAL FLUID. The spinal fluid findings were very helpful in diagnosis. In most cases the fluid was slightly or intensely xanthochromic, contained a large quantity of protein and clotted or formed a pellicle on standing (Froin's syndrome). In one instance the spinal fluid contained 4.5 grams % of protein! The cells were not significantly increased. The fluid may be bloody as a result

TAB
EPENDYMOMA OF CAUDA EQUINA.

Case No.	Age Sex	Symptoms	Physical Findings	Spinal Fluid
1	22 M	Low back pain.	Tenderness over sciatic nerve. Limited flexion of trunk.	Slightly xanthochromic. Total protein 116 mgm. %. Positive Queckenstedt test.
2*	44 M	Paraplegic for 10 years postoperatively.	Paraplegic.	Marked increase in globulin.
3	40 F	Low back pain radiating down distribution of both sciatic nerves.	Restriction of motion of trunk. Spasm sacrospinalis muscles.	Intensely xanthochromic. Total protein 3.6 grams. %.
4	20 M	Low back pain. Weakness of extremities.	Weakness of extremities.	Not available.
5	25 M	Headache, nausea and vomiting. "shooting" pains in legs and low back pains.	Tenderness lumbosacral region. Limited flexion and extension of back.	Extremely xanthochromic and bloody. Total protein 500 mgm. %.
6	37 M	Ache in coccyx when sitting. Burning sensation in left leg.	Tenderness in lumbar area. Limited flexion of spine. Limited straight leg raising.	Total protein elevated.
7	39 M	Pain in hip with sciatic nerve distribution. Pain on flexion of back.	Hypoesthesia small area of left leg. Positive Lasèque's sign, left side.	Not available.
8	59 F	Coldness of legs for 10 years. Anesthesia of extremities below knees. Paralysis of left leg, later both legs.	Paraplegic.	Not available.
9	65 M	Back pain radiating down left hip and thigh to knee. Urinary symptoms of urgency, hes tancy, and occasionally hematuria.	Weakness of extremities. Hyperactive patellar and Achilles reflexes.	Xanthochromic, RBC 36; WBC 15. Total protein 940 mgm. %. Pellicle formation.
10	49 F	Low back pain increased by sitting and lying down. "Shooting" pains down right leg. Urinary bladder paralysis. Obstipation.	Hyperactive patellar reflexes. Absent Achilles reflexes. Hyperesthesia at L 1 and L 2 dermatomes bilaterally.	Total protein 25 mgm. %.
11	39 F	Pain in back and leg.	Hypoactive patellar and Achilles reflexes.	Total protein 1 gram. %. Queckenstedt test positive.
12*	26 M	Low back pain radiating along distribution of sciatic nerve.	See case report.	Xanthochromic. Total protein 500 mgm. %.
13	45 M	Low back pain radiating along distribution of sciatic nerve. Anesthesia and pain below knees. Urinary bladder paralysis.	Hypoactive patellar and Achilles reflexes. "Jerking" of lower extremities. Swelling of lower extremities.	Not available.
14*	25	Pain in right hip and thigh radiating along distribution of sciatic nerve, intensified by coughing or sneezing.	Bilateral limited straight leg raising. Tenderness to percussion in lumbar area.	Xanthochromic.
15	65 M	Pain in back radiating down right leg.	Limitation of motion of back. Patellar and Achilles reflexes extremely hyperactive. Spasm of paravertebral muscles. Babinski sign positive bilaterally.	Total protein 300 mgm. %. Cells 1250.
16	38 M	Low back pain radiating to right hip. Weakness and numbness of right leg, later left leg.	Flaccid paraplegia. Tenderness in lumbar area. Absent deep tendon reflexes in lower extremities. Hypalgnesia below L 3 dermatomes. Urinary bladder and rectal paralysis.	Slightly bloody. Total protein 47 mgm. %.
17	34 F	Pain in lower back and right hip radiating in distribution of right sciatic nerve.	Achilles reflex absent on the right.	Total protein 215 mgm. %. Globulin 3+. Cells 1 segmenter, 1 lymphocyte.
18	35 F	Pain in right buttock radiating down right thigh. Numbness left leg, and perineum. Urinary bladder paralysis.	Tenderness lumbosacral area. Limited flexion of back. Absent right Achilles reflex. Hypalgnesia left foot. Weakness dorsiflexion of big toe.	Not available.

* See case reports.

of spontaneous hemorrhage from the neoplasm. The Queckenstedt test was positive in the four cases in which it was mentioned. In one case a cisternal tap revealed clear spinal fluid, and a simultaneous lumbar spinal tap revealed xanthochromic fluid.

ROENTGENOGRAPHY. Roentgenograms of

the lumbar spine, sacrum, and sacroiliac joints aided in diagnosis in one case in which there was destruction of the upper left portion of the sacrum approximately 6 cm. in transverse diameter. In two cases concomitant degenerative osteoarthritis of the sacral vertebrae was believed to be the cause

LE I

CLINICOPATHOLOGIC ASPECTS

Gross Pathology	Clinical Diagnosis	Original Pathologic Diagnosis	Type of Ependymoma Final Diagnosis
Dark vascular encapsulated tumor, 4X2 cm. with filum terminale internum attached.	Sacroiliac strain, right.	Ependymoma epithelial type.	Epithelial ependymoma.
See case report.	Recurrent astrocytoma.	Astrocytoma protoplasmicum.	Myxopapillary ependymoma.
Encapsulated red-gray tumor, 3.5X2 cm. spreading apart roots of cauda equina.	Extruded intervertebral disc between L 5 and S 1.	Tumor of cauda equina.	Epithelial ependymoma.
Encapsulated red-gray tumor, 2X1.5 cm. The cut surface has a "honey comb" appearance.	Tumor of filum terminale.	Ependymoma.	Epithelial ependymoma.
Soft, ovoid red-gray tumor, 2.5 cm.	Neurofibroma.	Ependymoma.	Epithelial ependymoma.
Ovoid tumor, 3X1.6 cm. of filum terminale. Located at L 1 to L 3.	Extruded intervertebral disc.	Hemangioma or hemangio-endothelioma.	Myxopapillary ependymoma.
Firm, round, encapsulated dark red tumor with vascular pedicle probably representing filum terminale. Located at L 3 to L 4.	Sciatic syndrome indicative of extruded intervertebral disc.	Hemangioma or hemangiomatous meningioma.	Epithelial ependymoma.
Encapsulated soft gray tumor, 10X1 cm. with involvement of conus medullaris.	Tumor of spinal cord or large ruptured intervertebral disc.	Astrocytoma Meningioma?	Myxopapillary ependymoma.
Discrete, ovoid, lobular, encapsulated, rubbery mass 4.5X2.2X1.3 cm. One surface yellow, the other mottled gray and hemorrhagic. (Fig. 3).	Tumor of spinal cord. Hypertrophy of prostate gland.	Ependymoma Hemangioblastoma? Sympathicoblastoma?	Cellular ependymoma.
Bulging tumor at conus medullaris.	Cauda equina syndrome.	Ependymoma.	Cellular ependymoma.
Cylindrical, encapsulated soft, purple-gray tumor, 4X2 cm. of filum terminale.	Tumor of cauda equina.	Ependymoma? Medulloepithelioma?	Epithelial ependymoma.
See case report.	Tumor of cauda equina.	Ependymoma.	Myxopapillary ependymoma.
Round, lobulated, encapsulated, gray tumor. Central soft hemorrhagic area on cut surface.	Not available.	Not available.	Cellular ependymoma.
Cone-shaped, encapsulated, soft purple-red tumor, 5X2 cm.	Tumor of spinal cord involving cauda equina.	Spongioblastoma ependymale.	Cellular ependymoma.
Ovoid, encapsulated, elastic, gray, hemorrhagic tumor of filum terminale, 3.4X1.6X1 cm.	Degenerative osteoarthritis lumbar vertebrae, or hemangioma of spinal cord.	Hemangioma.	Myxopapillary ependymoma.
Ovoid, slightly lobulated, thinly encapsulated tumor, 2.2X1.7X1.5 cm. Cut surface variegated gray-yellow and pink. Two cords representing remnants of filum terminale internum attached to specimen (Figs. 1, 2).	Neurofibroma of first sacral nerve root.	Ependymoma.	Epithelial ependymoma.
Lobulated, red-purple tumor, 2X2X1 cm. at L 1.	Herniated intervertebral disc at L 4 and L 5.	Ependymoma.	Cellular ependymoma.
Soft, gray, friable, glistening non-encapsulated tumor involving sacrum, spinal cord and nerve roots of L 5 and S 1.	Ruptured intervertebral disc.	Not available.	Myxopapillary ependymoma.

of back pain and a correct diagnosis of ependymoma of the cauda equina was long delayed.

Myelograms were of assistance in localization, diagnosis and differential diagnosis. Data on the results of myelography, available in 14 of 18 cases, are summarized on

the following page.

In 8 of the 14 cases the block was either at L 2 or L 3 or both.

OPERATIVE FINDINGS. Incisions were made in the midline usually between the spinous processes of D 12 and L 2 and the corresponding lamina removed. Laminec-

Case No.	Localization of complete block according to vertebrae.
3	L 5 and S 2
5	L 4 (cap formation above and below lesion)
6	Lumbar area
7	L 3 (proximal end of opaque column had a concave appearance)
8	L 3 and L 4
9	L 3 (partial obstruction at D 12 with convex line at superior pole, and the lower border at midportion of L 1)
10	L 2
11	L 2 and L 3
12	Lumbar area
14	L 3
15	L 2 (midportion)
16	L 3
17	L 1 and L 5
18	Lumbo-sacral level

tomies were done at higher and lower levels dependent on the localization of the neoplasm as determined by neurological examination and by myelography.

On exposure of the dura, as a rule, nothing could be seen. However, in several cases the dura bulged and a tumor could be palpated beneath the dura. On incising the dura, the usual finding was an extramedullary, oval, beefy-red, discrete, solid, slightly lobulated mass lying among the roots of the cauda equina, arising from the filum terminale internum, with its upper pole adjacent to the conus medullaris and its lower pole ending in the vicinity of L 3. The neoplasms averaged 4×2 cm. but in cases of long duration, they were cylindrical, measured up to 10 cm. in length and only 1 cm. in width, filled the sacral sac and over-rode the conus medullaris. Nerve filaments from the cauda equina may be incorporated in the neoplasm and have to be sacrificed in the dissection. A vascular pedicle, described in 5 cases, probably represented a congested filum terminale internum. In two cases the neoplasm was hidden beneath the nerves of the cauda equina and was not immediately visible on opening the dura. In one dramatic case, the patient strained as a result of pain while under anesthesia and literally "coughed the

tumor out" from among the roots of the cauda equina. In another case the surgeon stated that the lesion could be easily "popped" from among the roots of the cauda equina. In cases of the myxopapillary type of ependymoma the neoplasm may not be encapsulated, but invasive in the subarachnoid space; this type of neoplasm is gray, mucoid and glistening, and may be impossible to remove completely. In the majority of cases, a silver clip was placed on the filum terminale above and below the neoplasm, the neoplasm was freed from its bed, and readily removed *in toto* without excessive bleeding.

In this series there were no cases of extradural ependymoma, or combined intradural and extradural extramedullary ependymoma; all were intradural and extramedullary.

There were no operative deaths, convalescence was without serious complications, and most of the patients obtained immediate and dramatic relief from low back pain and recovery of sensory and motor function of the lower extremities.

PATHOLOGIC FINDINGS

GROSS. Characteristically, the neoplasms were oval, thinly encapsulated, occasionally lobulated, either firm or soft, occasionally resilient, red-gray, red-black, purple or mottled yellow, and measured from 4 to 31 cm. in length and 2 to 7.5 cm. in width. Five of the tumors had a pedicle, representing the filum terminale internum two of which were described as extremely vascular. One of the tumors was 10 cm. in length and 1 cm. in width. The elongated shape is characteristic of neoplasms of the cord and filum terminale since these neoplasms are confined to the bony spinal canal and are forced to grow along the path of least resistance, which is longitudinally in the subarachnoid space. Remnants of the filum terminale may be attached to the neoplasm (Figs. 1, 2, 3, and 14). In one case a gray mucoid glistening friable non-encapsulated neoplasm filled the sacral sac. The gross findings in three of four fatal cases are described subsequently. (See Plate

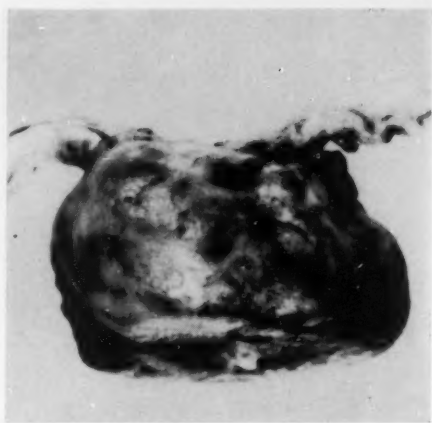


FIG. 1. Ependymoma, epithelial type showing external surface. The neoplasm is slightly lobulated, thinly encapsulated, red-gray, with two attached cords representing the filum terminale internum. $\times 3$. Case 16.



FIG. 2. Cut surface of ependymoma shown in Fig. 1. The cut surface is variegated gray-yellow and pink. $\times 3$. Case 16.

I for the pathologic appearance of Lachmann's case.)

MICROSCOPIC. Using Kernohan's^{31,33} early classification of ependymoma, the neoplasms were separated into three types: (1) *epithelial*, 7 cases; (2) *myxopapillary*, 6 cases; and (3) *cellular*, 5 cases.

Sections of the *epithelial* type stained with hematoxylin-eosin showed a highly vascular encapsulated neoplasm composed of cells with oval uniform nuclei with fine chromatin particles, no visible nucleoli, a distinct nu-

clear membrane, rather abundant eosinophilic cytoplasm and usually indistinct cell walls (Figs. 4, 5, and 6).

Some cells had vacuolated cytoplasm with inter-connecting protoplasmic strands between the cells. The cells palisaded around numerous hyalinized capillaries with their nuclei in antipodal position, that is, away from the lumen, to give the characteristic feature of a corona or rosette (Fig. 6). Mitotic figures, although present, were infrequent. Glial fibers were absent in Holzer-stained preparations. The neoplasm was supported by a fine reticulum limited to the walls of the blood vessels and the capsule. The capsule was thin and often suggillated with

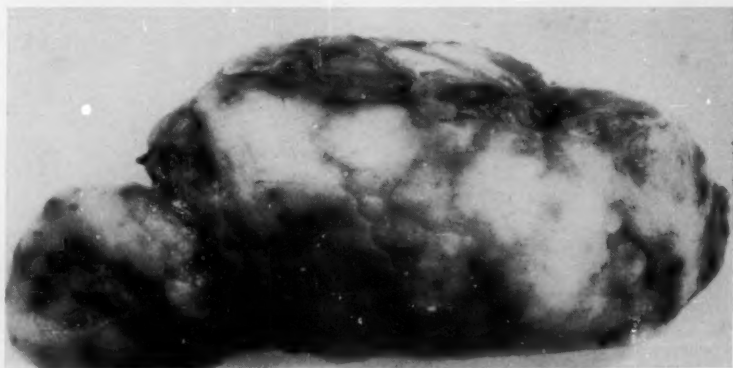


FIG. 3. Ependymoma, cellular type. The neoplasm is lobular, ovoid encapsulated and red-gray. $\times 2\frac{1}{2}$. Case 9.

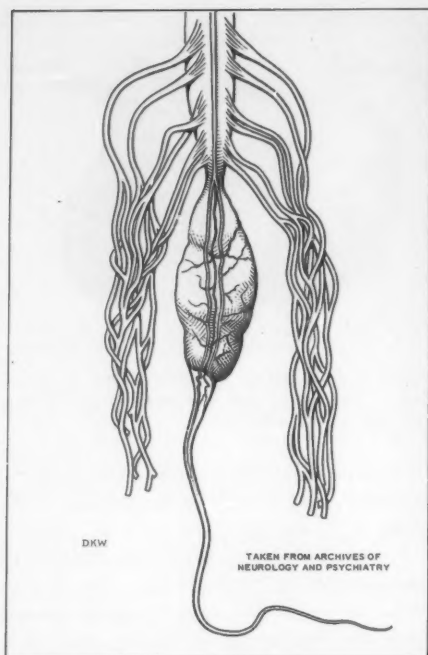


PLATE I. Ependymoma of the cauda equina.

red blood cells. Necrosis was absent. Within the neoplasm were large, irregular round spaces lined by palisaded ependymal cells, which contained either a granular protein-rich eosinophilic coagulum or red blood cells, or both. The evolution of these spaces could be traced. The first stage was the formation

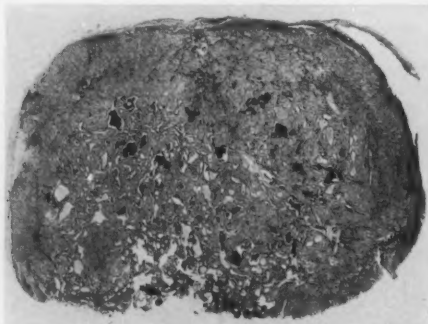


FIG. 4. Ependymoma, epithelial type, appearance under low magnification. The neoplasm is highly vascular, and surrounded by a thin capsule. $\times 4$. Case 4. AFIP NEG. 57-3744.

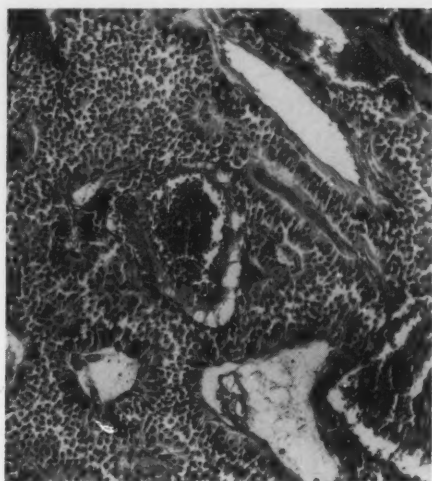


FIG. 5. Ependymoma, epithelial type. Photomicrograph demonstrates closely packed neoplastic ependymal cells, rosettes, coagulum-containing perivascular spaces, and palisading neoplastic cells. $\times 115$. Case 4. AFIP NEG. 57-3748.

of a loculus adjacent to the central capillary of an ependymal rosette (Fig. 7). The second stage was an increase in size of the loculus caused by the secretion of fluid into the loculus which displaced the capillary to

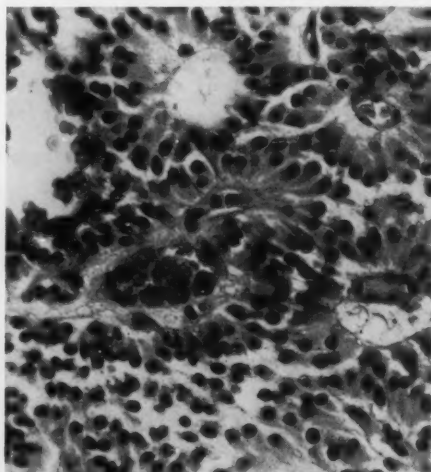


FIG. 6. Ependymoma, epithelial type. Rosettes or coronas composed of radiating perivascular ependymal cells with their nuclei in antipodal position. $\times 350$. Case 4. AFIP NEG. 57-3747.

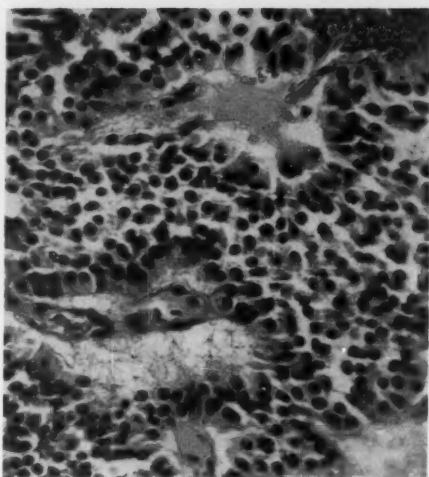


FIG. 7. Epithelial ependymoma. First stage in formation of stromal space. A proteinaceous coagulum is present in the perivascular spaces of the rosettes. x305. Case 4. AFIP NEG. 57-4169.

one side, or left it in a central location surrounded by fluid (Fig. 8). In the third stage, this unsupported and isolated capillary presumably ruptured to give an admixture of blood and protein-rich fluid within the space



FIG. 8. Epithelial ependymoma. Second stage in formation of stromal space. The perivascular space is larger, and several capillaries are displaced eccentrically. x305. Case 4. AFIP NEG. 57-3750.

(Fig. 9). There were large vascular spaces, partly lined by endothelial cells, between which coursed thin anastomosing strands of ependymal cells (Fig. 10).

Case 11 was unique in that ganglion cells which contained Nissl substance were found lying free in a hemorrhagic stroma or in nervous tissue-sheathed blood vessels of the cauda equina (Fig. 11). "Ependymal rings" as found in the myxopapillary type were absent or sparse and a fibrillar appearance as found in the cellular type was lacking.

Sections stained with the PAS (periodic acid-Schiff) method were positive for the material in the stromal spaces. Mucicarmine stains were negative. Reticulum stains revealed no reticulum between the neoplastic cells, but only in the capsule and blood vessels (Figs. 12 and 13). An incidental finding in Holzer stained preparation was 1-5 small round nucleoli in the neoplastic ependymal cells.

Sections of *myxopapillary ependymoma* stained with hematoxylin-eosin showed a thinly encapsulated oval vascular neoplasm composed of cells with irregularly oval, slightly pleomorphic nuclei with finely par-



FIG. 9. Epithelial ependymoma. Third stage in formation of stromal spaces; the large one is filled with a protein-rich coagulum. x115. Case 4. AFIP NEG. 57-3746.

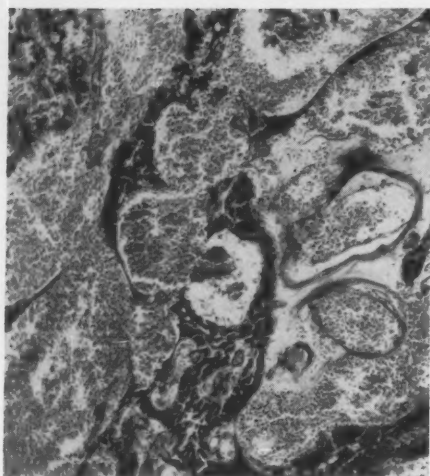


FIG. 10. Epithelial ependymoma. The neoplastic ependymal cells are arranged in anastomosing strands which enclose large blood-filled spaces, some of which contain capillaries. $\times 115$. Case 5. AFIP NEG. 57-4174.

ticulate chromatin, one to three small spherical nucleoli, and a distinct nuclear membrane (Fig. 15). Vacuolation of the cytoplasm, a prominent feature, resulted in anastomosis of cytoplasmic strands to give a myxomatous

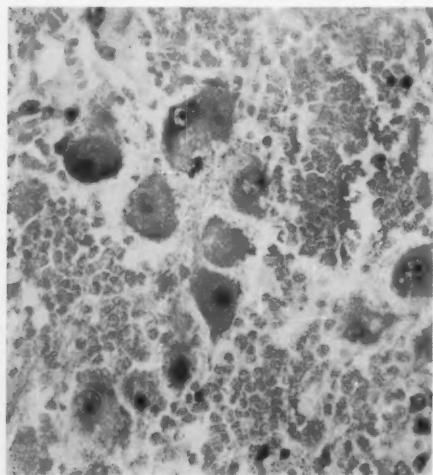


FIG. 11. Epithelial ependymoma with numerous ganglion cells in a hemorrhagic stroma. Nissl substance is present in the cytoplasm. $\times 220$. Case 11. AFIP. NEG. 57-7642.



FIG. 12. Epithelial ependymoma stained by Gomori's method for reticulum. Collagenous fibers are present in the capsule and blood vessels. There are no reticular fibers separating individual neoplastic ependymal cells. $\times 13$. Case 4. AFIP. NEG. 57-4170.

appearance (Fig. 16). Some capillaries were enclosed by a zone of blue-staining myxomatous substance surrounded by a ring of neoplastic cells (Fig. 17). Some of the vacuoles were confluent to form a round mucin-containing area about which ependymal cell nuclei were radially arranged to form a characteristic "ependymal ring" (Fig. 18). In other areas the cells were arranged around, and attached their cytoplasmic processes to small blood vessels. In still other areas ependymal cells covered papillary structures, the core of which contained hyalinized capillaries. Mitotic figures were rare. Reticulum was limited to the walls of blood vessels and the capsule (Fig. 19). The neoplasms were extremely vascular, and hemorrhage was present in the stroma. Stromal lakes of protein-rich fluid were present in some cases (Fig. 15). A remnant of filum terminale internum, which contained large blood vessels, collagenous strands, nervous tissue, and small ependymal cell-lined cavities, was attached to the neoplasm in several cases. Glial fibers were not demonstrated by Holzer's method. Muci-



FIG. 13. Epithelial ependymoma stained with Gomori's method for reticulum. Reticular fibers are limited to the blood vessels. $\times 115$. Case 5. AFIP NEG. 57-4176.

carmine stains were positive. Rosettes, as found in the epithelial type, were either absent or poorly formed and fibrillar cytoplasmic strands, as found in the cellular ependymomas, were absent. In far advanced cases the neoplastic tissue was not encapsulated and invaded the subarachnoid space, surrounded nerve roots, but usually did not penetrate the pia or the dura.

Sections of the *cellular type of ependymoma*, stained with hematoxylin-eosin, showed a highly vascular neoplasm composed of cells with slightly pleomorphic, plump, oval, crinkled nuclei with finely particulate chromatin, a well defined nuclear membrane, and abundant wavy fibrillar cytoplasm (Figs. 20, 21). These cells palisaded in a disorderly manner around capillaries, with their cytoplasmic processes directed inward toward the lumen. Some areas showed a fascicular arrangement, simulating sarcoma (Fig. 22). The neoplastic ependymal cells took on a columnar, almost epithelial appearance where they lined large lakes of blood or loci of protein-rich fluid. Hemorrhage and hemosiderin granules were present in the stroma. Many of the small blood vessels were hy-



FIG. 14. Epithelial ependymoma. The neoplasm is thinly encapsulated, solid, and a portion of highly vascular filum terminale internum is attached. $\times 4$. Case 16.

linized. Holzer's method demonstrated no glial fibers, PAS stains were negative, and mucicarmine stained preparations were negative for mucin. The cellular ependymomas had a more disorderly pattern of growth, had prominent wavy cytoplasmic processes, showed no rosettes as found in the epithelial type, and had no "ependymal rings" as found

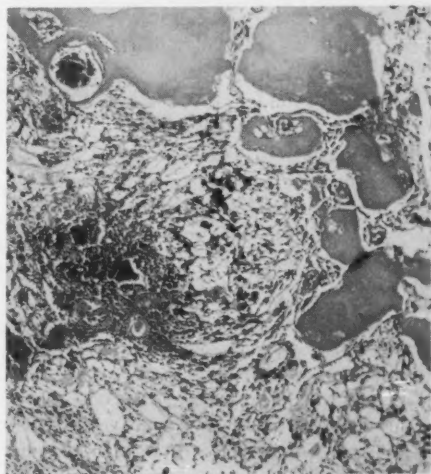


FIG. 15. Myxopapillary ependymoma. Neoplastic ependymal cells are arranged around clear spaces and embedded in a hemorrhagic stroma. Toward the lower left portion are lakes of protein-rich fluid. $\times 35$. Case 8. AFIP NEG. 57-7655.

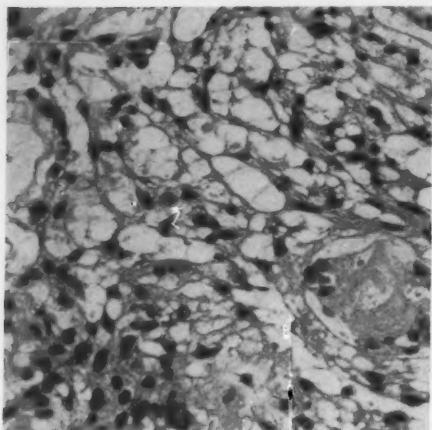


FIG. 16. Myxopapillary ependymoma. The cytoplasm is vacuolated and anastomosing protoplasmic strands enclose spaces to give a myxomatous appearance. $\times 220$. Case 6. AFIP NEG. 57-7651.

in the myxopapillary type. Reticular fibers were limited to the walls of blood vessels and to the capsule.

FOLLOW-UP STUDIES

We were able to obtain follow-up reports on all 18 patients who had ependymoma of the cauda equina (See Table IV). Four of these 18 patients are dead, a mortality rate of 22 per cent. Of the 14 living patients, 8 are alive and well and 6 have symptoms. Of these 6 patients only 1 is known definitely to have existing neoplasm; the symptoms of the other 5 may be caused by injury to nerve filaments, sustained at operation, or to irreparable damage to the spinal cord caused by long-standing neoplasm. Seven of the 18 patients had an epithelial type of ependymoma, 6 a myxopapillary type, and 5 a cellular type. All 7 patients who had tumor of an epithelial type are alive and with 2 exceptions (Cases 1, 3) are well. The follow-up period of patients with the epithelial type varied from 1 to 16 years, an average of 6 years. Of the patients with the myxopapillary type of ependymoma, 3 are dead, 2 are alive and well one year postoperatively, and one is alive but very ill with existing neoplasm. The postoperative follow-up period of these cases

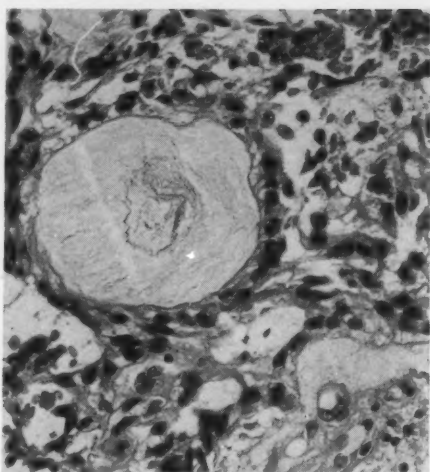


FIG. 17. Myxopapillary ependymoma. There is a zone of mucoid material around a capillary, peripheral to which are neoplastic ependymal cells. $\times 220$. Case 6. AFIP NEG. 57-7650.

varied from 6 months to 14 years, with an average of $4\frac{1}{2}$ years. The 3 patients who died of myxopapillary ependymoma (Cases 2, 8, 12) had a postoperative survival of 10 years, 6 months, and 14 years, respectively, and preoperative symptoms had been present for 10 and 2 years in 2 of these cases. Of the 5 pa-

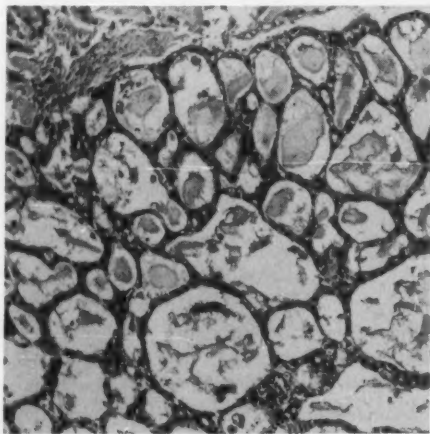


FIG. 18. Myxopapillary ependymoma. Numerous "ependymal rings" filled with mucin positive coagulum are characteristic. $\times 85$. Case 18. AFIP NEG. 57-7654.

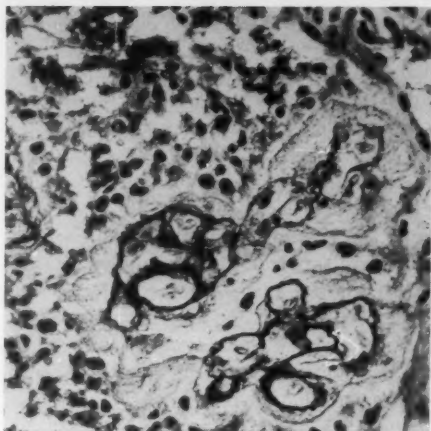


FIG. 19. Myxopapillary ependymoma. Reticulum is limited to capillaries. Gomori's method for reticulum, x220. Case 6. AFIP NEG. 57-7652.

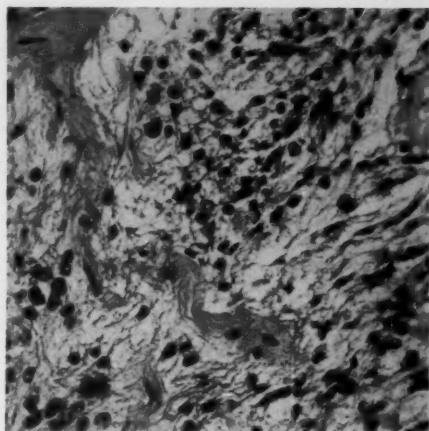


FIG. 21. Cellular ependymoma. Detail of Fig. 20, to demonstrate fibrillar cytoplasmic processes, x220. Case 13. AFIP NEG. 57-7647.

tients with a cellular type of ependymoma, one is dead, 3 are alive but with symptoms, and one was alive and well 6 months postoperatively.

There appears to be a correlation between the pathologic type of neoplasm and prognosis. Patients who have an epithelial type of ependymoma appear to have an excellent

prognosis, while the long-range outlook for those with a myxopapillary or cellular type of ependymoma appears poor, particularly if operative excision is delayed for a long time.

The immediate prognosis is good in all types of ependymoma since in most cases there is complete or almost complete relief of symptoms within a week postoperatively. This statement does not hold true for those patients who have had symptoms for many years prior to operation, although some improvement may be expected. There was no operative mortality.

THREE CASE REPORTS OF EPENDYMOMA OF THE CAUDA EQUINA WHICH CAUSED DEATH

CASE 2. (AFIP Acc. 274961) The patient, a white male veteran, 54 years of age, had a tumor of the cauda equina surgically excised in 1938. The pathologic diagnosis was protoplasmic astrocytoma. He continued to have pain in the back and was admitted to a hospital for treatment of a recurrent neoplasm. Eight years later he was completely disabled, bedridden, and partially paraplegic. Roentgenograms showed a sacral neoplasm to be slowly progressive. He died in 1948, 10 years after a futile attempt to remove the neoplasm surgically. Death was caused by

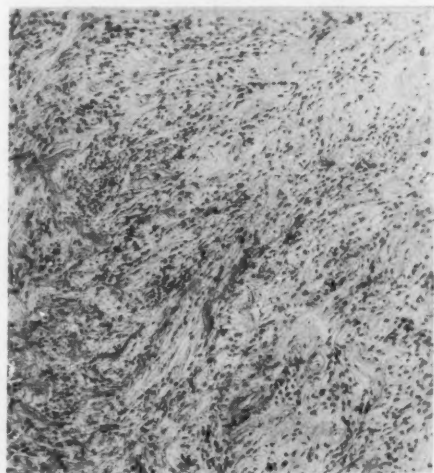


FIG. 20. Cellular ependymoma. Neoplasm has uniform oval nuclei, prominent fibrillar cytoplasmic processes, and an irregular fascicular pattern. x60. Case 13. AFIP NEG. 57-7646.

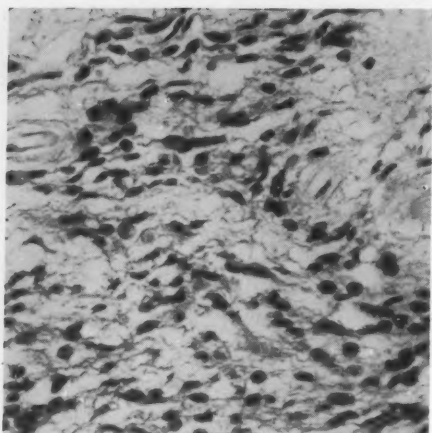


FIG. 22. Cellular ependymoma. The neoplasm has an almost fascicular arrangement of cells simulating sarcoma. x220, Case 13. AFIP NEG. 57-7649.

large decubitus ulcers which led to osteomyelitis, septicemia and septic infarcts of the lungs.

At autopsy the body was extremely emaciated. There was a well healed operative scar, 11 cm. in length in the midline of the lumbosacral region. The spinous processes of the third, fourth and fifth lumbar vertebrae had been removed at operation. At the level of the first and second lumbar vertebrae the spinal cord and cauda equina were intact. At the level of L3 the spinal canal showed beginning erosion which increased in severity to the region of L4; at the level of L5 bony destruction was almost complete so that the fifth lumbar vertebrae, the sacrum and the right ilium adjacent to the sacrum were completely destroyed and replaced by tumor. The tumor extended anteriorly into the pelvic cavity and posteriorly to lie directly beneath a large decubitus ulcer over the upper portion of the sacrum in the midline. The tumor was red-brown, friable, edematous and gelatinous. At the origin of the cauda equina the tumor was attached to several nerve roots, with several neoplastic nodules attached to the emerging nerves of the cauda equina. The neoplasm involved the body of the fifth lumbar vertebra, the entire sacrum and the

adjacent ilium, bilaterally. Other significant gross findings were septic infarcts of the lung with abscess formation, and coronary arteriosclerosis with myocardial fibrosis.

For the most part the microscopic appearance of the neoplasm was that of a typical myxopapillary ependymoma. "Ependymal rings" were particularly well formed. The cells were more vacuolated than in other cases and simulated the appearance of astrocytes, which explains the original erroneous diagnosis of astrocytoma protoplasmicum. Several areas of the neoplasm differed from the usual appearance of myxopapillary ependymoma in that the cells were closely packed, polygonal, and the nuclei were pleomorphic. These areas had a more malignant appearance and were not present in any of our other cases. The neoplastic tissue invaded

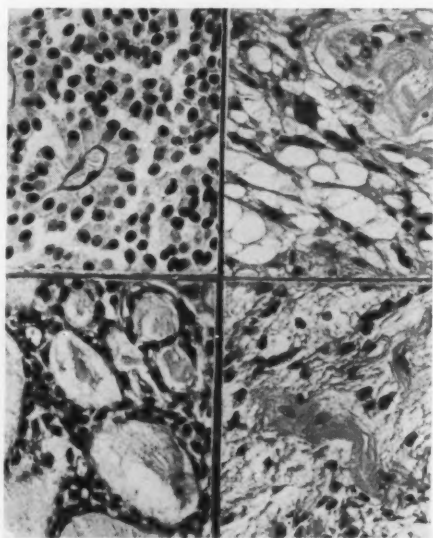


FIG. 23. Photomicrograph demonstrates diagnostic features of the three types of ependymoma of the cauda equina.

Upper left: Rosettes of the epithelial type.

Upper right: Myxomatous appearance of the myxopapillary type.

Lower left: "Ependymal rings" in the myxopapillary type.

Lower right: Fibrillar processes in the cellular type. All magnifications x220. Cases 4, 6, 18, and 13, respectively.

along the subarachnoid space, enclosed and compressed, but did not penetrate the roots or the spinal cord.

CASE 12. (AFIP Acc. 611267) The patient, a white male veteran, 56 years of age, had two laminectomies for ependymoma of the cauda equina. The first operation was performed by Dr. A. W. Adson of the Mayo Clinic in 1938, and the second, for recurrent neoplasm, in 1946, 6 years prior to his terminal illness.

In 1936, while cultivating corn, he had sudden onset of severe backache which lasted for a few days and recurred 8 months later, again for only a few days. Four months later the pain recurred and persisted. There was severe pain in the upper lumbar region which radiated to the left leg. Coughing, sneezing, constipation, straining at stool or "stubbing" his toe aggravated the pain. According to the patient the most remarkable feature of his illness was that he could not lie in bed at night because of intensification of pain and he had to get up and walk around to obtain relief. He could not find an "easy" position and would sit by the bed and doze. Sometimes he would walk out doors without his family's knowledge. He saw several local physicians but did not obtain relief from pain and finally went to the Mayo Clinic. A neurological examination was negative. Treatment by spinal traction did not relieve the pain. A spinal tap revealed xanthochromic fluid with total protein of 500 mgm. percent. A myelogram demonstrated complete spinal block in the lumbar area. A laminectomy was done with excision of a large encapsulated myxopapillary ependymoma.

He made a remarkable recovery and was free of symptoms for 7 years when pain and soreness in the back recurred, associated with numbness of the left leg after an attack of pain. Quick backward movements of the head or tilting the head to one side with full extension of the neck intensified the back pain. He was admitted to a hospital. Neurological examination was negative except for tenderness over the lower

end of the laminectomy scar, and pain in the back on straight leg raising, more severe on the left. Laminectomy revealed a recurrent reddish gray infiltrating tumor, involving the cauda equina, which was removed piecemeal. Postoperatively, he obtained complete relief from back pain but began to have frequency of urination, dribbling of urine at night, constipation and increasing weakness in the left leg. There was marked atrophy of muscles of the lower extremities, more on the left, absent Achilles reflexes, absent left cremasteric reflex, loss of vibratory sensation of the left lower extremity up to the knee, and hyperesthesia to touch and pain in the saddle area, as well as the scrotum. He received a course of deep X-ray therapy with good response.

He was free of back pain for 4 years thereafter, when he again had low back pain which spread to the right buttock, and radiated down the left leg. Neurological findings were similar to those on his prior admissions. He was given 3000 r deep X-ray therapy over two anterior abdominal fields and obtained prompt relief from back pain.

About one and one-half years later abdominal cramps, nausea and vomiting developed and he was admitted to a hospital for the last time. Examination revealed an acutely ill dehydrated patient with a left foot drop, atrophy and absent tendon reflexes of the lower extremities. Diagnoses of recurrent ependymoma of the cauda equina and radiation enterocolitis were made. Roentgenograms revealed intestinal obstruction and jejunosolic fistula. At operation there were multiple fistulae between the small and large bowel and it was necessary to do a colectomy, partial jejunectomy and a sigmoidocecostomy. Intestinal obstruction persisted and another laparotomy failed to relieve the obstruction. He became jaundiced, developed septicemia and died 6 weeks after admission, 14 years after his first operation, and 16 years after onset of symptoms.

At autopsy there was a small, irregularly shaped fungating necrotic tumor, which measured 3×1 cm., in the cauda equina.

There was severe generalized peritonitis secondary to irradiation therapy, with irradiation necrosis, intestinal obstruction, multiple intestinal fistulae, obstructive jaundice, and cholemic nephrosis. Microscopically, sections of the neoplasm removed at autopsy, showed a myxopapillary ependymoma similar to those previously described, except for degenerative changes caused by x-irradiation. The neoplasm was loose in texture and resembled a "myxoma" in that the cells were connected by cytoplasmic strands, the interstices of which were filled with a pale blue-staining mucinous substance. There were no ependymal rings.

CASE 14. (AFIP Acc. 118130). The patient, a white male veteran, 26 years of age, was readmitted to a hospital with paraplegia and pain in the right hip and thigh. A neoplasm of the cauda equina had been excised about 5 months previously. The surgical specimen consisted of a cone-shaped piece of soft, mottled purple-red, friable, glistening tissue which measured 5 cm. in length and 2 cm. at its base. The cut surfaces were soft, partly gray-white and partly red and hemorrhagic. He received two series of deep X-ray therapy. About 6 months later, in addition to paraplegia, he began to have sensory and motor disturbances in the upper extremities, ocular pareses, and died shortly thereafter.

At autopsy the subarachnoid space was infiltrated with gray-white gelatinous neoplastic tissue, posteriorly along the entire length of the spinal cord, which compressed the spinal cord, particularly in the upper thoracic and cervical regions. A small, firm, smooth, pearly-white nodule, which measured 0.2×0.1 cm. was present on the inner surface of the dura in the region of the cauda equina. Three similar nodules were present on the surface of the cord in the cervical and thoracic regions. Other significant findings were cystitis and pyelonephritis.

Sections showed a cellular ependymoma which was more pleomorphic, more cellular, less organized, and grew more diffusely than the ependymomas previously described. The

neoplasm invaded along the subarachnoid space, enclosed and invaded nerve roots, but did not penetrate either the pia or the dura. In some areas it would be most difficult to differentiate the tumor from a cellular astrocytoma.

DISCUSSION

See Table II for clinicopathologic correlation.

It is necessary to discuss certain aspects of ependymoma of the cauda equina which are not completely brought out by our cases. Finscher²⁶ reported the cases of three patients with ependymoma of the cauda equina who had repeated attacks of intractable pain in the lower extremities and profound headache caused by spontaneous subarachnoid hemorrhage from ependymomas. He stated that such symptoms should prompt early myelographic contrast studies before compressive or destructive spinal root symptoms are in objective evidence. He also stated, and we certainly agree on the basis of our studies, that symptoms in the early development of cauda equina neoplasm are subjective, there being no motor, sensory, or spinal cord dysfunction. There was no spinal subarachnoid block in his cases. Only one of our patients had spontaneous subarachnoid hemorrhage.

Rarely, the initial symptom may be loss of vision caused by papilledema. In this regard, Gardner, Spitler, and Whitten³⁰ reported a case of a large vascular ependymoma of the cauda equina in a woman 52 years of age, who had papilledema and episodes of loss of vision over a period of 5 years. Their opinion is that a small tumor located anywhere along the cerebrospinal axis may cause increased intracranial pressure, papilledema and hydrocephalus. They present evidence that spinal fluid serum proteins from the neoplasm pile up against the blood-brain barrier and cause partial obstruction of the absorptive areas of the brain. Love, Wagener, and Woltman²⁵ reported a similar case.

Symptoms referable to the urinary bladder caused by ependymoma of the cauda equina

TABLE II
EPENDYMOMA OF CAUDA EQUINA. CLINICOPATHOLOGIC CORRELATION

Clinical Findings	Explanation
1. <i>Sensory</i>	
a. Low back pain.	Irritation by neoplasm of posterior roots. Elsberg believes there is also irritation of inner surface of dura. Same as above.
b. Tenderness on palpation or percussion over lumbar area.	
c. Pain in back and limitation of motion of trunk and extremities on movement of extremities.	Places tension on cauda equina with irritation of posterior roots.
d. Pain radiating down sciatic nerve with tenderness of sciatic nerve.	Radicular neuralgia due to posterior nerve root involvement.
e. Pain in back on sneezing, coughing or straining at stool.	Characteristic of root pain origin; increased cerebrospinal fluid pressure is transmitted to neoplasm and to posterior roots.
f. Parathesias as "shooting" pains, tingling, and "electric shock" sensations.	Characteristic of posterior root irritation
g. Sensory disturbances in upper extremities.	Indicates extension of metastases of neoplasm in subarachnoid space to involved posterior roots in cervicothoracic region.
h. Hyperesthesia.	Irritation of posterior roots.
i. Anesthesia.	More extensive involvement of lowest sacral roots. Often "saddle anesthesia" (anesthesia of backs of thighs, buttocks, anus and perineum).
j. Analgesia	More extensive involvement of posterior roots.
2. <i>Motor</i>	
a. Fasciculation of muscles of lower extremities.	Irritation of neurones of anterior column of spinal cord.
b. Muscle jerks of lower extremities.	Irritation of anterior roots.
c. Spasm of muscles of back (chiefly erector spinae).	Irritation of anterior roots.
d. Atrophy of muscles of lower extremities.	Disuse atrophy or trophic muscular atrophy due to involvement of lower motor neurone pathway.
e. Weakness of muscles.	Lower motor neurone pathway.
f. Paraplegia, flaccid.	Extensive involvement of lower motor neurone pathway. May indicate rupture of neoplasm through its capsule and extension into sacral sac.
g. Paralysis of levator ani.	Coccygeal root involvement.
3. <i>Reflexes</i>	
a. Hyperactive patellar and Achilles reflexes.	Irritation of anterior roots.
b. Hypoactive or lost patellar reflex.	More extensive involvement of lower motor neurone pathway. Reflex center—third and fourth lumbar segments.
c. Hypoactive or lost Achilles reflex.	More extensive involvement of lower motor neurone pathway. Reflex center—first and second sacral segments.
d. Plantar.	
(1) Loss of reflex.	Involvement of fourth and fifth lumbar and fifth sacral.
(2) Normal plantar.	Involvement below fifth sacral root or above fourth lumbar, but not involving conus medullaris.
(3) Extensor. (Babinski's sign).	Indicates pyramidal tract involvement.
e. Cremasteric reflex loss.	First lumbar segment.

(Continued on page 28)

TABLE II—(continued)

Clinical Findings	Explanation
4. <i>Trophic disturbances.</i>	
a. Edema and coldness of extremities.	Trophic manifestations due to involvement of lower neurone pathway, primarily S 2, 3 & 4. Also, possibly the involvement sensory pathways.
5. <i>Other Findings.</i>	
a. Urinary tract: dysuria, retention of urine, incontinence, delay in voiding.	Involvement of third and fourth sacral roots with uninhibited action of internal sphincter of bladder.
b. Obstipation and constipation.	Involvement of third and fourth sacral roots with uninhibited action of internal sphincter of anus. Fear of increased pain in back due to increase in spinal fluid pressure on straining at stool. ¹⁷
c. Fincher's syndrome ²⁸ (headache, backache, intractable pain in lower extremities).	Spontaneous hemorrhage into subarachnoid space from neoplasm with increase in spinal fluid pressure, irritation of posterior roots.
d. Loss of vision, papilledema. ^{25,30}	Increased protein in spinal fluid with block of absorptive areas of brain.
e. Sexual dysfunction, impotence.	S 1, 2, and 3
f. Lasègue's sign: Pain and resistance on extending the leg at the knee and flexing at the hip.	This sign is caused by stretching of the sciatic nerve, is ordinarily indicative of sciatica, but may often be positive in cauda equina-neoplasms.
g. Erosion of bone, usually sacrum, as demonstrated by roentgenography.	Erosion of bone may be due to pressure of neoplasm, or later, invasion of bone.
h. Froin's syndrome: xanthochromia, increased globulin, and coagulability of spinal fluid.	The xanthochromia is probably the result of seepage of red blood cells through capsule of neoplasm with formation of bilirubin. Protein derived from the neoplasm accumulates caudad to the subarachnoid block.
i. Positive Queckenstedt test.	Blockage of subarachnoid space by neoplasm.

may direct attention away from a correct diagnosis. These symptoms are dribbling of urine, inability to void, retention of urine, hesitancy, and urgency. In this regard prostatectomy had been performed for benign hypertrophy of the prostate in two of our cases before the correct diagnosis was made. Lachmann's case at first was erroneously diagnosed as carcinoma of the bladder. His patient was a man, 46 years of age, who had dribbling of urine, dysuria, and obstipation for three years, and parathesia of the lower extremities for two years. Examination revealed a markedly distended bladder, relaxed bladder sphincter, obstipation and exaggerated patellar reflexes. The patient died and at autopsy there was an ependymoma of the cauda equina and no carcinoma of the bladder (Plate I).

Ependymoma of the cauda equina may be diagnosed erroneously as herniated intervertebral disk and operation performed without

relief of symptoms. This was true in our Case 6, in which exploration for a herniated disk was futile, and also in Massachusetts General Hospital Case 32491,¹⁷ in which operation for ruptured intervertebral disk did not relieve symptoms. Dr. R. Eustace Semmes, who discussed the latter case, mentioned an important feature which may serve to differentiate between herniated intervertebral disk and ependymoma of the cauda equina; in the latter there is aggravation of low back pain when the patient is sitting or lying down, with relief on standing, whereas most patients with herniated intervertebral disk obtain relief from pain on lying down. The favored preoperative diagnosis in 6 of our cases was herniated intervertebral disk.

Craig³² points out that neoplasms of the spinal cord may be mistaken for primary disease of the nervous system. He reports the case of a man, 34 years of age, who had intermittent backache and leg pain for 10

years associated with bilateral weakness and muscular atrophy of the legs, and severe atrophy of the buttocks. An erroneous diagnosis of neuropathic (peroneal) atrophy, (Charcot-Marie-Tooth disease) had been made. An ependymoma of the cauda equina, diagnosed by myelography, was excised.

Roentgenograms which demonstrate bony destruction are of diagnostic value in a few cases. Only two of our cases had erosion of the sacrum. Bailey⁹ reported the case of a girl with ependymoma of the cauda equina whose roentgenograms showed a concavity of the posterior walls of the first to the fifth lumbar vertebrae, and partially of the first sacral vertebra, which produced narrowing of the anteroposterior diameter throughout the lumbar region. Juba²³ noted erosion of the bodies of the lumbar vertebra in a girl, 19 years of age, who had a similar neoplasm.

The treatment of ependymoma of the cauda equina is surgical excision. *Early diagnosis is of extreme importance*, since at first these neoplasms are encapsulated and may be excised with relative ease. Later, the capsule may rupture and the neoplasm extend and seed throughout the spinal subarachnoid space, making operative removal difficult or impossible. In a case of this type Bailey⁹ found it necessary to attempt removal of an ependymoma with a pituitary spoon. Treatment with deep X-ray therapy seems indicated only for palliation in cases of recurrent ependymoma after operation has failed to effect a cure. X-ray therapy may cause dramatic relief of symptoms but appears to have no curative value. In one of our patients with a myxopapillary ependymoma, intensive deep X-ray therapy did not effect a cure, the patient dying of radiation enterocolitis. Six of the patients in this series were treated with surgery and deep X-ray therapy and 12 were treated only by surgery.

In the diagnosis of ependymoma of the cauda equina the chronology of the appearance of symptoms is important. The first symptoms are pain and soreness of the lower back with radiation of pain down the sciatic nerve, often associated with paresthesias.

Later, there is anesthesia followed by flaccid atrophic paralysis. The early sensory symptoms are caused by irritation of the posterior sensory roots by the expanding neoplasm. Sensory root bundles are more numerous and larger than the motor root bundles in the lumbar area and consequently are more likely to be involved first by a neoplasm.³⁴ Bladder and bowel function are seldom affected early in the disease as cauda equina symptoms are asymmetrical because of early asymmetrical growth of the neoplasm; when the conus medullaris is involved these symptoms are early and severe.³⁵

Sensory and motor root signs and symptoms are valuable because they point to the level of the lesion. The following segmental (vertical) location is given by Foerster:³⁶

- Irritation of L1 gives pain or paresthesia, localized to inguinal region and region around trochanter major
- Irritation of L2 gives pain or paresthesia, localized to anterior aspect of thigh
- Irritation of L3 gives pain or paresthesia, localized to the knee
- Irritation of L4 gives pain or paresthesia, localized to internal malleolus—big toe
- Irritation of L5 gives pain or paresthesia, localized to dorsum pedis and toes
- Irritation of S1 gives pain or paresthesia, localized to planta pedis and heel
- Irritation of S2 gives pain or paresthesia, localized to back of lower limb, particularly popliteal region
- Irritation of S3 gives pain or paresthesia, localized to gluteal fold
- Irritation of S4-5 gives pain or paresthesia, localized to anus, penis, and vulva

The lesions may be localized transversely, approximately in relation to the spinous processes as follows:³⁷

Spinal Segment		Spinous Process
D12	corresponds to	D10
L1	corresponds to	D10-11
L2	corresponds to	D11
L3	corresponds to	D11-12
L4-5 } S1 {	corresponds to	D12
S2-5	corresponds to	L1

Ependymomas may arise from the medial portion of the filum terminale and there-

TABLE III
DIFFERENTIAL DIAGNOSTIC SYMPTOMATOLOGY BETWEEN EPENDYMOMA OF THE
CAUDA EQUINA AND CONUS MEDULLARIS*

<i>Cauda Equina</i>	<i>Conus Medullaris</i>
1. Symptomatology referable to roots; unilateral at onset.	Symptomatology referable to spinal cord; bilateral at onset.
2. Onset often insidious, slow progress of symptoms.	Rapid onset, rapid progress of symptoms.
3. Pain occurs early, precedes onset of objective signs for a long time, follows course of roots—back of thighs or legs, or buttocks.	Severe neuralgic pains rarely noted.
4. Impairment or loss of all forms of sensation in a dermatome or dermatomes.	Dissociation of sensation; loss or impairment of pain and temperature sensation, preservation of tactile sensation.
5. "Saddle" anesthesia when lowest sacral roots are involved.	"Saddle" anesthesia characteristic.
6. Bladder and rectal disturbances develop late.	Bladder and rectal disturbances occur early and are severe.
7. Weakness of extremities with late development of atrophic flaccid paralyses.	Rapid onset of paraplegia.
8. Trophic disturbances sometimes occur.	Trophic disturbances common.
9. Deep reflexes variable. Hyperactive with irritation of anterior roots; loss with more extensive involvement of roots.	Only ankle jerk may be lost and the patellar reflex normal. Extensor plantar response (Babinski's sign) when epiconus is involved.
10. Paralysis of levator ani when coccygeal root alone is involved.	
11. Reflex spasm of erector spinae.	Not present.
12. Bulbocavernosus reflex (in male) may be intact, although there is paralysis of bladder and rectum.	May also occur.

* See Kinnier-Wilson,³⁵ and Wechsler.⁴⁵

fore first attack the sacrococcygeal roots which lie next to the midline. In this regard, a "high" caudal equinal tumor may injure "low" roots, and conversely a "low" tumor may not, at least at first, cause interference with rectal, vesical, or reproductive functions which are innervated by "low" roots, unless there is bilateral involvement.³⁵ It should be emphasized that a small tumor of the cauda equina may cause severe and prolonged symptoms. Tarlov⁸ reported an ependymoma of the cauda equina which measured only 1.3×0.4 cm., but had caused sacral and sciatic pain for seven years.

It is difficult and sometimes impossible to differentiate between an ependymoma of the cauda equina and one of the conus medullaris, as they may co-exist. However, such differentiation should be attempted because of the less favorable prognosis in the latter, and to facilitate planning of the operative attack. See Table III for differential

symptomatology between tumors of the cauda equina and conus medullaris.

Froin's syndrome is an important diagnostic finding. To demonstrate this syndrome it is necessary to perform the spinal puncture well below the level of the lesion, otherwise a "dry" tap may result. However, a "dry" tap may be significant, indicating that the needle is at the level of the neoplasm.

In the differential diagnosis of ependymomas of the cauda equina, sciatica, ruptured intervertebral disc, brain tumors, other spinal tumors of the cauda equina, genito-urinary tract disease, and pelvic tumors should be considered. Although sciatica may simulate ependymomas of the cauda equina it is unusual for sciatica to be bilateral. When urinary tract symptoms, constipation or sexual dysfunction are associated with low back pain radiating to the extremities, a neurological examination would probably reveal neurologic findings pointing toward the correct

TABLE IV
EPENDYMOMA OF THE CAUDA EQUINA. FOLLOW-UP STUDIES

Case No.	Type of Ependymoma		Status	Post-operative follow-up period	Pre-operative duration of symptoms	Treatment
1	Epithelial	Alive	Backache; numbness of legs.	16 years	7 months	Surgery
3	Epithelial	Alive	Paralysis bladder and rectum	3 years	3 years	Surgery & X-ray
4	Epithelial	Alive	Well	5 years	1 year	Surgery
5	Epithelial	Alive	Well	2 years	9 months	Surgery
7	Epithelial	Alive	Well	1 year	7 months	Surgery
11	Epithelial	Alive	Well	13 years	?	Surgery
16	Epithelial	Alive	Well	1½ years	6 months	Surgery & X-ray
2	Myxopapillary	Dead	Paraplegic; died of secondary infection.	10 years	?	Surgery
6	Myxopapillary	Alive	Well	1 year	14 months	Surgery
8	Myxopapillary	Dead	Paralysis of one leg; died of malnutrition and dehydration.	6 months	10 years	Surgery
12	Myxopapillary	Dead	Died of recurrent ependymoma and irradiation enterocolitis.	14 years	2 years	Surgery & X-ray
15	Myxopapillary	Alive	Well	4 years	10 years	Surgery
18	Myxopapillary	Alive	Exploratory laminectomy revealed sacral sac filled with neoplasm; could not be excised.	1 year	13 years	Surgery
9	Cellular	Alive	"Slight" paralysis of legs	6 months	3 years	Surgery & X-ray
10	Cellular	Alive	No back pain—bladder and bowel dysfunction persisted post-operatively.	1 year, 4 months	3 years	Surgery
14	Cellular	Dead	No back pain—bladder and bowel dysfunction persisted post-operatively.	4 months	1½ years	Surgery & X-ray
14	Cellular	Dead	Paraplegic. Patient died of metastases in subarachnoid space.	10 months	?	Surgery
13	Cellular	Alive	Weakness of legs; hypoaesthesia and pain below knees; absent patellar and Achilles reflexes; urinary bladder paralysis.	6 years	7 years	Surgery & X-ray
17	Cellular	Alive	Well	6 months	2 weeks	Surgery

Note. Follow-up reports to Spring of 1957.

diagnosis. Neoplasms other than ependymoma, such as neurofibroma, meningioma, occur in the region of the cauda equina and may give rise to similar symptoms and cannot surely be differentiated without surgical intervention and pathologic examination. The pain in ruptured intervertebral disc is aggravated by standing up, while that in patients with ependymoma is relieved; however, pre-operative diagnosis may be difficult. When a patient complains of severe headache, backache, and intractable pain in the lower extremities, a spinal tap should be done; the

presence of bloody spinal fluid should lead one to suspect Fincher's syndrome and a myelogram would in all probability confirm the diagnosis of ependymoma of the cauda equina with spontaneous hemorrhage. Loss of vision and choked discs are indication for a neurological examination of the extremities, to exclude neoplasm of the cauda equina. Presacral neoplasms may simulate the clinical picture of ependymoma of the cauda equina, but most of the neoplasms are sufficiently low so that they are palpable on pelvic examination.

TABLE V
BIBLIOGRAPHY OF CASES OF EPENDYMOMA
OF THE CAUDA EQUINA

Authors	Number of Cases	Date Pub- lished
Lachmann ¹	1	1882
Saxer ²	1	1902
Leszynsky ³	1	1914
Bernstein and Horwitt ⁴	(1)*	1914
Orlandi ⁵	1	1931
Llambias and Fitte ⁶	1	1931
Guillain and Bertrand ⁷	2	1934
Tarlow ⁸	1	1934
Bailey ⁹	1	1935
Foerster and Gagel ¹⁰	3	1936
Kernohan and Fletcher-Kernohan ¹¹ (Mayo Clinic)	(20)†	1937
Lorz ¹²	1	1938
Cohen, Kelly and Hughes ¹³	1	1939
Rasmussen, Kernohan and Adson ¹⁴ (Mayo Clinic)	(32)	1940
Wolf ¹⁵	4	1941
Marino ¹⁶	1	1941
Massachusetts General Hospital Case 32491 ¹⁷	1	1946
Zettergren ¹⁸	2	1948
Bach ¹⁹	1	1949
Floris ²⁰	1	1950
Wertheimer, Allégre and Garde ²¹	7	1950
Jorio ²²	1	1950
Juba ²³	2	1951
Troland, Kendrick, Sahyoun and Mandeville ²⁴	1	1951
Love, Wagener and Woltman ²⁵	1	1951
Fincher ²⁶	3	1951
Lüthy and Irsigler ²⁷	12	1952
Paillas, Dongier and Badier ²⁸	2	1952
Catalano and Saracino ²⁹	1	1954
Gardner, Spittler and Whitten ³⁰	1	1954
Weiss ³¹	1	1955
Craig ³²	1	1957
Ayres	18	1957
Total:	107	

* Same case reported by Leszynsky.³

† Mayo Clinic series. These cases also reported by Rasmussen, Kernohan and Adson.¹⁴

For an understanding of the pathologic aspects of cauda ependymoma it is desirable to review briefly the gross and microscopic anatomy of the filum terminale.³⁸ The filum terminale consists of two parts: (1) The

filum terminale internum, the upper portion, which extends from the conus medullaris and ends at the bottom of the dural sac at the level of the second sacral vertebra; and (2) the *filum terminale externum*, the lower portion, which begins at the closed end of the sacral sac as a continuation of the filum terminale internum, becomes closely invested with dura and continues inferiorly to attach to the posterior surface of the first coccygeal bone. Those ependymomas derived from the filum terminale internum are intradural and extramedullary; all of our cases and the majority of those reported in the literature are of this type. Those ependymomas derived from the filum terminale externum are extradural and extramedullary; Rasmussen, Kernohan and Adson¹⁴ reported two ependymomas of this type and three cases of extramedullary ependymoma that were both extradural and intradural. Of Wolf's¹⁵ 20 cases of ependymoma of the spinal cord, four were extramedullary and intradural, and one of these was both intradural and extradural.

Histologically, there is ample evidence that ependymal cells and other nervous tissue cells extend into the filum terminale and may serve as origin for ependymomas. Tourneux³⁹ found that the ependymal cell-lined central canal of the spinal cord extended into the filum terminale as far as the sacral cul-de-sac; "epithelial cells" and neurones were found in the filum terminale internum within 0.1 cm. of its mergeance with the filum terminale externum. Harmer⁴⁰ demonstrated that all cellular elements found in the spinal cord were present in the filum terminale internum. Neurones were confined mainly to the upper half; ependymal cell-lined cavities were present and axis cylinders extended the entire length of the filum terminale. It seems clear that most of these neoplasms are derived from the filum terminale. However, one must consider the view of Collins and Elsberg⁴¹ that some of these neoplasms may arise in the pia, and by inference from ependymal rests and not from the filum terminale. Kernohan, Woltman, and Adson³³

state that their gliomas were derived from the cauda equina region, and conus medullaris and filum terminale; they pointed out that it is possible that some ependymomas could be derived from ependymal masses attached to the nerve fibers of the cauda equina. In this regard, we recently saw an extramedullary ependymal cyst in the pontobulbar region which probably had its origin in a leptomeningeal ependymal rest.

The original pathologic diagnoses were available in 16 of 18 cases. Of 7 cases of epithelial ependymoma 5 were originally diagnosed correctly, while of 5 cases of myxopapillary ependymoma, only one was originally diagnosed correctly; of four cellular ependymomas three were originally diagnosed correctly. The myxopapillary type of ependymoma caused the most difficulty in pathologic diagnosis, and was commonly mistaken for hemangioma or hemangioblastoma because of its extreme vascularity (See Table I).

As regards the histopathological aspects of these neoplasms we can add but little to their description by Kernohan and associates^{11, 33, 42, 43, 44} and Wolf.¹⁵ We would like to emphasize the extreme vascularity of these neoplasms and to point out that they may be readily mistaken for hemangioblastomas. Their vascularity and the thinness of the capsule explains the etiology of spontaneous subarachnoid hemorrhage which gives rise to Fincher's syndrome. Diapedesis of red blood cells through the capsule or hemorrhage appears responsible for the xanthochromic spinal fluid. The presence of large spaces filled with protein-rich fluid adds support for Gardner and associates'³⁰ theory of hydrocephalus caused by obstruction of absorptive areas of the brain by protein derived from tumors. We have also presented a hypothesis, based on histologic evidence, for the formation of large spaces within the epithelial type of ependymomas. The presence of ganglion cells within an ependymoma of the cauda equina, as far as we are aware, is reported for the first time. There were no metastases other than in the subarachnoid

in our cases. However, Weiss³¹ reports the case of a white man, 22 years of age, who had an ependymoma of the cauda equina which metastasized to the liver, lungs, hilar lymph nodes, mediastinal soft tissue, chest wall, and extended to vertebrae, spinal musculature, and the pelvic and common iliac veins. His patient had five unsuccessful operations for removal of the neoplasm over a period of 10 years. This unique case, according to Weiss³¹ is the first reported ependymoma of the central nervous system and the first spinal cord tumor that has metastasized to different organs. A mass in the upper left lung field in Case 18 of this series is suggestive of a metastasis (June 1957).

It is apparent that the clinical and pathologic diagnosis may be most difficult. *Awareness of this entity coupled with a careful history, physical and neurological examination, studies of the spinal fluid, roentgenography of the lower spine and myelography should permit a correct diagnosis in almost all cases. It is hoped that this paper will in some measure aid in the early diagnosis of ependymoma of the cauda equina and thereby prevent suffering or death in military personnel, their dependents, and civilians alike.*

SUMMARY

1. The clinicopathologic aspects, operative findings, diagnosis and treatment, and discussion of 18 cases of ependymoma of the cauda equina are presented.

2. Of the 18 cases of ependymoma of the cauda equina, 7 were the epithelial type, 6 the myxopapillary type, and 4 were the cellular type.

3. Follow-up studies on 18 patients are reported. Four patients are dead, a mortality rate of 22 percent. Of 14 known living patients, 8 are alive and well and 6 are alive but symptomatic. All 7 patients who had an epithelial ependymoma are alive, 5 are well and two have symptoms probably not related to recurrent neoplasm. Three of 6 patients who had a diagnosis of myxopapillary ependymoma are dead, two are alive and well and one is alive but seriously ill with existing

neoplasm. Of 5 patients with cellular ependymoma, one is dead, 3 are alive but symptomatic, and one is alive and well. The long-range prognosis for patients with epithelial ependymoma is good, while the prognosis in patients with myxopapillary ependymoma appears poor.

4. The immediate prognosis in all types of ependymoma after excision appears good, and most patients obtain relief from symptoms.

5. Ganglion cells in a ependymoma of the cauda equina are reported for the first time.

6. A theory as to the evolution of protein-rich stromal spaces within ependymomas of the cauda equina is presented.

7. Deep X-ray therapy appears to have no curative value, but some palliative value.

8. Three fatal cases of ependymoma of the cauda equina with autopsy findings are reported in detail.

9. A bibliography of cases of ependymoma of the cauda equina published in the world literature is given. Approximately 107 cases have been reported, including this series of 18.

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Memorable Events, Lives, and Books, Calendar of Commemoration for 1958

By

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"Odi profanum vulgus at arceo. . ."

(I hate the profane crowd)

HORACE. *Odes*, III, 1.

HUMAN history has its heroes, since advancement, progress and perfection of any kind have always required leaders who, after recognizing the value of new ideas, took hold of them and brought them to materialization, often in spite of the fad of the contemporary crowd. Great men will find their own ways to reach their ideals and to carry out the tasks they are destined to do. Without them, history would become a lifeless description of a ghost world, left behind by the impersonal society of nameless and classless masses of uncounted centuries.

Distinguished personalities and event-making figures always stood honored among people who build on traditions and who wish to learn from the experience of others, though avoiding the mere copy of the past. Indeed, even the most revolutionary masses need courageous leaders, daring heroes to guide them into novel situations along the unbroken road of adventures.

Moreover, no man can embrace mere moral values; he desires to see their individual incarnations. And herein lies the great pedagogic force of history. We recognize the good qualities of the great men of the past, but we are also aware of their many defects. Those are desirable, these are avoidable. Yet, flawless or faulty as they may be, the heroes remain the almost perpetual tangible examples of human destiny, personalities who by their ideas, capabilities, scientific achievements or artistic craft won a distinction and rose above the "profane crowd."

At the advent of a new year, let's stop for a moment in the fast progress of the modern

world to glance backward upon the events, lives, and outstanding achievements which our search for tangible examples of human values can single out for commemoration and imitation in 1958.

PART 1: MEMORABLE EVENTS

This year our commemorative search in the past will arbitrarily concentrate on dates whose numbers end in 08 or 58, B.C. or A.D. The earliest of them is 5508 B.C. which marks the beginning of the Ecclesiastical Era of Constantinople. The Mundane Era starts with 4008 B.C. The Greek mythology has it that *Cecrops City* was destroyed in 1558 B.C., a date from the Bronze Age culture. The town was established by Cecrops, who as an Egyptian colonist came to Attica where he organized community life, introduced burial of the dead, and invented writing. Egypt changed its ruler in 1358 B.C. when Ikhnoton, the religious revolutionary, died and *Tutankhamen*, his son-in-law, took over the reign. It was this Tutankhamen whose tomb was discovered near Luxor in 1922 and became the source of the mysterious death of a series of Egyptologists who dared to disturb the rest of the Pharaoh. Another old date brings back the memory of *Eurystheus* who reigned as a king in the town of Mycenae, on the coast of the Aegean Sea, around 1258 B.C. This king kept *Herakles* in servitude and ordered him to perform his twelve labors the last one of which was when Herakles brought up the three-headed Cerberus, the watchdog of the Hades, to the king who was so frightened that he crawled into a wine barrel.

Late in the eighth century (708 B.C.) the city State of *Tarentum* was founded by a Spartan colonist. Many other cities were built by the emigrant Greeks in Southern Italy. Among them few were as famous as *Sybaris* and *Croton*. Both rapidly increased in size and wealth and extended their dominion, yet being able to remain in peaceful coexistence. *Sybaris* was 6 miles and *Croton* 12 miles in circumference. The *Crotonians* were perfect in athletic exercises while the *Sybarites* were notorious for their excessive and fastidious luxury. Once a tyrant got hold of the government of *Sybaris* and banished many citizens. The refugees were admitted to *Croton*, whereupon the tyrant declared war against the neighbor city. But the *Crotonians* utterly destroyed the army of *Sybaris* in 508 B.C., and changed the course of a river so that even the traces of the once luxurious city were swept away.

Livy tells us the somewhat legendary story which must have taken place about the same time (508 B.C.) in Rome. King Tarquin, the Proud, was expelled from Rome, and he sought the aid of his Etruscan kin, Porsenna, for the recovery of his kingdom. But Porsenna's forces were prevented from entering the city by the heroism of *Horatius Cocles*, who, with his two companions, held the head of a wooden bridge over the Tiber against the Etruscans while other Romans were destroying the bridge behind him. Then, he plunged into the Tiber and safely swam across its waves. Fable has it also that, when Porsenna laid siege to the town, Mucius, one of 300 Roman youths who swore to kill the king, stole into Porsenna's camp, but killed the king's aid by mistake. When he was caught, he thrust his right arm into a burning camp-fire to demonstrate the courage of his comrades, which influenced the king so much that he made a hasty peace with Rome. Thereafter, the young hero was called *Mucius Scaevola* (i.e., "the Left-handed"). The same year witnessed a peculiarly modern method of power politics when Rome concluded a *treaty with Carthage*, the African city, whereby the parties made a

division of the contemporary civilized world according to their "orbits of influence." The treaty recognized Carthage's exclusive interests in Africa, and Rome's in Latium. But, even in Antiquity, agreements were promptly made and promptly broken.

In 458 B.C., the Roman Army was in danger of being destroyed by the Aequians. Then, seeing that the slow democratic way would be of no help, the Roman Senate appointed L. Quinctius *Cincinnatus* as the dictatorial leader and, to notify him of his appointment, the Senate sent a delegation to the field where he was working on his small farm. *Cincinnatus* assumed the task, collected an army, defeated the enemy, and then resigned his dictatorship—all this within the period of 16 days. He has been held out ever since as an ideal of old-fashioned simplicity, ability, and virtue.

In Rome, the earthquake of 358 B.C. caused a huge chasm in the earth on the forum. Livy narrates that everyone was frightened and the priests forecast great calamities unless the wealth of the state were thrown into the abyss. Then, Mettus *Curtius*, a noble Roman youth, armed and mounted on a horse, jumped into the chasm, shouting: "Rome has no greater riches than courage and arms." An admirable legendary heroic sacrifice!

For the Romans, 58 B.C. was a year full of momentous events. A few years before they had established a sort of presidium, composed of three leaders and called the triumvirate. But neither the triumvirs, one of whom was Julius Caesar, nor the people were really happy with this form of government. One of the opponents was Porcius *Cato*, the Irreconcilable, who was then given an "overseas" assignment to keep him out of the way of the politicians. *Cicero*, the famous orator, had to take voluntary (?) refuge at Thessalonica while a bill of the Senate condemned him to exile and confiscated his houses at Rome, Formiae, and Tusculum. Caesar was also dissatisfied with his secondary rank in the presidium. He thought that he needed a little more military

glory to become a popular hero able to rival Pompey's reputation. He also needed money. Hence, under some pretext, he launched a long war against the Gauls in 58 B.C.; in his first campaign he massacred the tribe of Helvetians, and in a second move he defeated the German Ariovistus. Thus, he achieved the distinction he desired; moreover, he collected many interesting military observations which he left for us in his memoirs "*De bello Gallico*."

When in the 13th century, Genghis Khan desolated a great part of Asia and many inhabitants (Turks, Circassians, etc.) were sold as slaves, the sultan of Egypt bought 12,000 of them, and formed them into a body of troops, calling them *Mamelukes* (i.e., slaves). They soon found their power great, and in about 1258 A.D., they killed the sultan and set up one of their own as ruler of Egypt, and their reign lasted for 263 years. In 1308 A.D., the general disorder in Rome and Italy made it desirable to remove the papal seat to Avignon, whereby started the 70 years' long so-called *Babylonian captivity* of the papal court.

Since the mid-fifteenth century, the power of the Turks had been expanding, and Sultan Mohammed continued his conquests on the Balkan. The Christians tried everything to stop the progress of the Turks. Venice engaged the abilities of Scanderbeg for this purpose. Aeneas Sylvius, when he became *Pope Pius II* in 1458, soon found an opportunity to send a letter to Mohammed inviting him to embrace Christianity and to become the emperor of the Greeks and the East. Contemporary with this great humanist pope was *King Matthias* the Just, in Hungary. In 1458 when he was elected king he was just a 16-year-old lad, but he developed into a model king, and under the influence of Beatrice, his Italian wife, he fostered the arts and sciences in his kingdom, established two universities, ordered the beautiful copying of illustrated medical and other codexes ("the Corvinas"), introduced the printing press, etc. After his death (1490) the common people said that justice had departed.

He left Hungary the dominant state in Central Europe.

One hundred years later, in 1558, England was pushed out from its last possession in France when *Calais* was captured by the Duke of Guise. This made the English panicky, and the loss touched the heart of Queen Mary so much that she said: "When I am dead, Calais will be found written on my heart." She died in November of the same year, to be followed by Queen Elizabeth whose long reign (1558-1603) is called the "*Golden Age of England*." As daughter of Henry VIII and Anne Boleyn, she was considered by the Catholics a heretic and a bastard. She belonged to the Anglican (Episcopalian) Church, but there were many non-conformists or dissenters in England such as the *Puritans* who wanted to substitute a simple early Christian ritual.

The history of North America provides a few memorable dates and events. In 1608, *John Smith* became the *president* of the very young colony at Jamestown. This was also the year when a little dissenting congregation, with William Bradford a leading member, fled from England to Holland, later to become the nucleus of the Plymouth settlement. In the second half of the 17th century, Sweden launched several campaigns against its neighbors. In 1658, the frost was so severe that the whole Swedish Army could cross the Little Belt over the ice from Holstein to Denmark. But the Danes offered a valiant and successful *defense of Copenhagen*.

It happened on 27 July 1708 that the Russian ambassador to England was imprisoned for debt, by a lace-merchant. The incident urged Queen Anne to pass a statute for the protection of the ambassadors. Let's here recall the memory of *Thomas Dover*, English physician and buccaneer who in 1708 was induced to become the promoter of an expedition of pillage to the South Seas. He was the one who found Alexander Selkirk, the prototype of Robinson Crusoe, on the deserted island of Juan de Fernández where three years before he had been left by

an irate ship-captain. Doctor Dover is also remembered by the sudorific "Dover's powder." The year 1708 in American history marks the attack of the French and Indians upon Haverhill, Mass. At this time, three-fifths of the *population of the English colonies* of America were black. This was partly due to the activities of the long-established (1662) Royal African Company, with the English king one of its shareholders. The chief profit of this company was derived from exportation of Negroes from Guinea, where they were sold by other Negroes, to the plantations in America.

In the Seven Years' War, the year 1758 was the one when all parties suffered losses: the French were defeated at Crefeld, the Russians at Zorndorf, and the Prussians at Hochkirch. The American history again recorded battles in which the British made themselves masters of several French settlements (Fort Frontenac, Louisbourg, etc.). In November, after several unsuccessful attempts, General Forbes captured *Fort Duquesne* and renamed it Fort Pitt (site of the later Pittsburgh).

Many European and some American events of 1808 emanated from Napoleon and the French power politics. The *Peninsular War*, which started in 1808 by the British against the French in Portugal and Spain, extended for many years. The world also witnessed the revengeful hatred of the Spanish peasants against the French who began to worry the well-armed French troops by conducting their own "little war" ("*guerrilla*"). For the French people, Emperor Napoleon re-created a *new nobility*, since the old nobility had been abolished at the time of the French Revolution, and the 600 volumes of records of the nobility had been burnt (1792) at the foot of the statue of Louis XIV.

In the United States, the importation of *slaves was abolished*, after the first of January, 1808. Napoleon, by his *Bayonne Decree*, ordered the seizure of all U.S. vessels entering French, Italian, and Hanseatic towns because, as he put it, they are disguised

English vessels. Thus, Napoleon gained about ten-million dollars worth of U.S. ships and cargo. Jefferson's *embargo on U.S. trade* with foreign countries was intended to prevent such a piracy, but in 1808 it was opposed by many Americans, especially by New England ship-owners and southern planters.

A hundred years ago *Vesuvius* caused great damage by its eruption, and Corinth was nearly destroyed by earthquake. In January, 1858, Count Felice Orsini attempted to assassinate Napoleon III when, with the Empress, he was driving to the opera in Paris. This was one of six attempts to kill this emperor. In the U.S. a hundred years ago the *national debt* almost reached 45 million (yes, million) dollars. On 11 May, 1858, the government of *Minnesota* was organized.

In spite of the various laws against slave trade in the U.S., an American slave-ship (the *Echo*) was discovered, seized, and taken to Charleston. According to the records, seven slaves were sold at New Orleans in 1858, without a guaranty, at an average price of \$1,538 apiece. In its *constitution*, *Kansas* voted against slavery. On this account, when its admission was discussed in Congress, Southern congressmen blocked it. Thus, since Kansas did not want a pro-slavery constitution, it remained a territory until the Secession of the South, in 1860. As a territory, it remained open and free to slavery, owing to the Dred Scott decision.

A most *exciting election contest* occurred in another western state, in Illinois. Douglas's second term in the Senate was about to expire, and he returned to Illinois in the summer of 1858 to canvass for reelection. He was the most popular man for his courageous opposition in the Kansas constitution affair. He thus was an apparent foe to the slave interests. The Republicans, however, were under no illusion. They said that Douglas was with them in the Kansas affair, yet they did not believe him. So they nominated Abraham Lincoln. Both *Lincoln and Douglas* were self-made men, born in poverty. But

their careers were different. Douglas was all success; Lincoln was all failure. He was the best lawyer, though. By the summer of 1858, Lincoln was the most prominent republican in Illinois. He clearly saw the issue about slavery, and saw that a crisis must come. He forecast: "A house divided against itself cannot stand." Finally, the two opponents came to open discussion on the same platform, through seven towns only, but their audience was of much wider extent. The Washington Administration considered the whole affair as a disreputable exhibition of "a pair of depraved, blustering, mischievous, low-down demagogues." Their debate at Freeport, when Lincoln forced Douglas to enunciate his so-called "*Freeport heresy*," made national history. Douglas was the winner of the senatorship by the narrow margin of eight votes, but the wisdom and cleverness of Lincoln won him great repute.

ARTS AND SCIENCES

After this brief excursion into general history, let us select now some memorable events from the history of culture and civilization. Such an event may be the foundation of a town: *Milano* was built in 408 B.C. by the Insubrian Gauls. Another isolated event of cultural significance occurred in 158 B.C. when Scipio Nasica introduced the clepsydra, or *water clock*, in Rome. Some of the great epidemics are also of cultural importance. In 558 A.D., the recrudescence of a long-lasting and dreadful epidemic of bubonic plague extended over Europe, Asia, and Africa. This is known as the *plague of Justinian*. Many detailed records preserved the various clinical and epidemiological features of the plague. Procopius, a Byzantine writer, noted that "it left neither inland nor cave nor mountain range which had human inhabitants." It saturated the entire Mediterranean area thoroughly, always entering a new country by way of a port. Some estimated that the total death in this plague reached perhaps 100 millions—the highest in the history of the human race. The usual good wish to the sneezers, "God bless you!", is

supposed to have originated at this time.

Other memorable early medieval cultural events were the establishment of the *first bank* in Italy by the Lombard Jews (808 A.D.), the foundation of the ancient capital of "*Opslo*" (1058 A.D.), the inundation of Ostend and Flanders by the sea (1108), the completion of a wooden *cathedral at Chichester* (1108). In 1158 A.D., the *bank of Venice* was established, and the Bremen merchants first visited Livonia, a Russian province on the Baltic Sea. The town of *Berlin* was provided with hospitals: The St. George Hospital was erected in 1158, and the Holy Ghost Hospital in 1208. One of the finest specimens of Early English architecture is the *cathedral of Salisbury* which was finished in 1258. A letter of the same year mentions that Roger Bacon demonstrated at Oxford "a black, ugly stone called a *magnet* which had the surprising quality of drawing iron to it; a needle rubbed on it and then fastened to a straw floating on water would instantly turn toward the Pole Star."

In 1308, the *University of Coimbra* was established. We learn that *glass mirrors* were manufactured at this time in Murano. In London, the *Barber Surgeons* formed a company. In 1408, Berlin's St. Gertrude Hospital was finished, and London was provided with the Leadenhall Market (it stood until 1880). In 1458, the *Magdalene College* of Oxford was founded. In Constantinople, the Turks built the palace called the *Old Serai*. About this time, the *Leipzig fairs* assumed regular character.

The year 1508 is the foundation date of the *University of Alcalá*. In Rome, Michelangelo was given the assignment by Pope Julius II to decorate the *Sistine Chapel* in true renaissance spirit. The history, as the artist put it, shows how Judaism and the Graeco-Roman paganism were the antechamber to Christianity. This is the year when the famous *guaiac tree* or the tree of life (*Lignum Vitae*) was imported from the New World to Europe. It was considered a magic remedy against various ailments, in-

cluding the infamous epidemic syphilis of the 16th century.

Fifty years later (1558), the *University of Jena* was chartered and opened by imperial authorization. In Rome, Philip of Neri founded the *Congregation of the Oratory*, partly to the end to withdraw the contemporary youth from dangerous amusements by sacred musical entertainments (then called "oratorios"), which proved a very effective form of dealing with juvenile delinquency. In Russia, the Czar granted lands to the *Stroganovs*, a pioneer family which during the next twenty years carried civilization into the Tartar kingdom whose capital was Siber. In 1558, Liverpool was made a "paved city." Gentlemen began to put their *ladies' handkerchiefs* in their hats; these kerchiefs were wrought and edged with gold, and valued 5-12 pence apiece. *Street lighting* was introduced in Paris and lamps were hanged on ropes. *Tobacco* was introduced to Europe in 1558 by Francisco Hernández, a Spanish physician (others ascribe it to Hernández de Oviedo). Niccolo Massa, an Italian physician, suggested that wordlessness (*aphasia*) after head injury should be treated by relieving the brain from pressure.

In 1608, *Quebec* was founded. Champlain built a blockhouse, and the city arose around it, running the risks of starvation and extinction at the hands of the Indians. At the same time, Henry Hudson was studying the edge of the ice-pack between the Spitsbergen and Novaja Zemlja in a vain effort to find a passage through it. At the Hague, on 2 October 1608, Hans Lippersheim, an optician of Middelburg, obtained a patent for making a *telescopic instrument* of the opera-glass type. Similar patent was considered on 17 October by James Adriaansz (Metius) who claimed that he had worked on it for two years. Soon afterwards, a Dutch merchant sold a telescope on the Frankfurt fair. Thomas Coryate acquainted England with the *forks* as they had been in use in Italy for a long time. Many new chemical drugs were described in Croll's *Basilica Chymica*. In this year, calomel was first prepared (Beguín),

and benzoic acid was discovered (De Vignere).

For the new Jamestown colony of the English, 1608 was full of activities. John Smith was instructed by two Indians how to raise *corn*; the colonists were faced with starvation and they gladly accepted the new grain. Not so the women in Louisiana, who staged a "*pettycoat rebellion*" against corn eating, indignantly complaining: "Is this the honey and milk we were promised to have in the New World?" At Jamestown, the first women also arrived, a Mrs. Forrest and her maid, Anne Burras. New colonists were also imported, mechanics from Germany and Poland, to start the manufacture of *glass* and *glass beads* which were used for trade and commerce with the Indians. A factory was established in October 1608 in the woods, yet most of the workmen left when they found out that tobacco-growing was more profitable than industry. The first bottle of American make was blown the same year. Already then, the small colony was capable of shipping the *first export cargo* from America to England; it consisted of such manufactured goods as pitch, tar, soap, ashes, and glass.

Advances in technology and sciences were more numerous around the middle of the 17th century. Thus, in 1658, the chain bridge was invented (Brouncker), while Robert Hooke, the mechanical genius, invented the spiral spring for watches. The Dutch ship-lifting machine (Baker), Guericke's weather mannikin, and the first serviceable air-pump (Hooke), are of the same date. Huygens discovered the law of swinging motion. Athanasius Kircher, the scholarly Jesuit, found bacteria in the milk, and stated that plague is caused by living germs ("*contagium animatum*"). Biologists used the microscope more and more often, and Swammerdam was the first to see the *red blood-cells* of a frog in 1658 (his correct description was published 80 years later only). Wepfer discovered that *apoplexy* is a bleeding into the brain. Thevenot surprised his guests by serving *coffee after dinner*, something un-

heard of in the early 17th century in Europe. In America, two fur traders, Radisson and Groseilliers, visited the Mississippi in 1658, and left a record of their travels. In New York, the first *market house for meat* was erected on Bowling Green. Dr. Varravanger, surgeon of the Dutch West India Company, set up the *first hospital in New York*, perhaps the first in North America. It was a clean house, with firewood, supervised by a matron. Women were much wanted in those days in America so that servants and innocent country girls were kidnapped in England; they arrived penniless in the New World, but they married well and attained some distinguished social status.

In the early 18th century, Böttger, the apprentice of a pharmacist, invented the method of making *porcelain*. He settled in Dresden about 1708. Soon, the factory at Meissen was established. The medical diagnostics was enriched in 1708 when Stephen Hales introduced his "haemodynamometer" for the *measurement of blood-pressure*. Thebesius, a German physician, described the valves of the coronary sinus of the heart and the *veins of the heart*.

Two hundred years ago (1758), the *Magdalene Hospital* was founded in London. Haen began to use the *thermometer* to measure the patient's temperature at the clinics of Wien. In America, the first *sugar mill* was built in New Orleans in 1758. Anglican missionaries established a school for Negroes in Philadelphia. Just about the same time, Ben Franklin composed his "Early to bed and early to rise—Makes a man healthy, wealthy and wise." Even 200 years ago, Russian and American scientists tried to keep up with each other's achievement and progress. Thus Franklin's *experiments with the kite* were repeated in 1758 in Russia, but the unfortunate Kirchman in Sankt Petersburg was instantly killed by the lightning which he enticed.

Many scholarly institutions, schools, and societies were founded in 1808 (Univ. of Strassburg, of Lyon, of Clermont-Ferand) including the medical schools of Bahia and

Rio. It was perhaps a sign of the times that two Frenchmen fought their *duel in balloons*. The first steamboat to make a trip to sea was the *Phoenix* of John Stevens. Night watchmen in London could no more enjoy a good night's sleep because the *control clocks* came into use. The heavy earth metals were isolated by electrolysis (Davy), amorphous boron was discovered (Gay-Lussac), and Dalton announced his atomistic hypothesis in the *New System of Chemical Philosophy*. In medicine, bronchiectasis and bronchitis were recognized, hydrotherapy was introduced, and tracheotomy was suggested for the treatment of croup.

In the U.S., the foundation of the *Academy of Fine Arts* made New York the art center of America in 1808, as New Orleans became the operatic center when the *Théâtre d'Orleans* was built. Fulton converted his *Clermont* into a floating palace which started her course of gay passages for the second year in April. *Anthracite coal* was first burnt in an open grate on February 11th in the home of a judge at Wilkes-Barre, Pa., while at Medfield, Mass., the first American *brushes* were manufactured by Artemus Woodward.

One hundred years ago, on 11 Feb. 1858, the Holy Virgin was said to have appeared in a *grotto at Lourdes*, France, to Bernadette Soubiroux, a 14-year-old girl and to another girl. The grotto is now one of Catholicism's greatest shrines. The centennial jubilee will soon begin and continue for a year. Millions of pilgrims come here year after year from the whole world, asking for a miraculous cure for a beloved one. The hopelessly ill are carried from two hospitals to bathe in the cold waters in a building, believing that, if their faith is strong enough, they will be healed. There are several very strict medical committees to pass judgment on the nature of any cure at Lourdes. The city has now 800 hotels to take care of the many travelers, and a huge underground basilica which can accommodate 20,000 pilgrims at once.

During 1858, further attempts were made

to lay a *transatlantic cable*. The second attempt failed; the third voyage of the cable-layers was successful. On 5 August, the junction between Europe and America was completed. The cable was laid by Cyrus Field, an American engineer. On 7 August, the first two messages were exchanged between Queen Victoria and the president of the U.S. The Queen cabled: "Europe and America are united by telegraph." The reply went: "Glory to God in the highest; on earth peace, good will towards men." The first news dispatch by cable was received on 26 August, and was published in the *New York Sun*; it stated the treaty of peace concluded by China at Tien-tsin. But the insulation of the cable wire became faulty, and the power of transmission again ceased completely on 4 Sept.

A hundred years ago, Charles Darwin, before the Linnean Society of London, gave the first public *lecture on evolution*. It resulted from studies which Darwin made during a cruise from 1831 to 1836 on the *Beagle*. (This famous tour will be repeated in 1958.) Darwin was then an official naturalist of the expedition which visited islands of the Atlantic and Pacific. His first ideas of evolution were born during this voyage. A Committee for the anniversary, headed by Huxley and Lady Nora Barlow, a descendant of Darwin, was announced in New York. In the same year, the British "*Medical Act*" was established to regulate the qualifications of practitioners by a General Council. Certification of the dentists also began in the same year. London was provided with a *Dental Hospital*. In the summer of 1858 London suffered from a great contamination of the Thames. All the sewage of London was pouring into the river until finally the emanation of bad odors produced what the contemporaries called the *Great Stench* which forced even the House of Commons to legislate behind closed windows while the travelers made wide detours to avoid the low bridges of London. On 9 September 1858 the *first autopsy* ever made in Japan was performed at Nagasaki University. The

Japanese people were greatly excited about it, and it took some time to convince them that the section was for the people's welfare.

In the United States, the *Crystal Palace* of New York was destroyed by fire a century ago, and a great number of articles perished. The building of *St. Patrick's Cathedral* started (it took 21 years to finish it), and the *Central Park* of New York was laid out, containing also a reservoir of about a billion gallons' capacity. At Louisville, Ky., an artesian well was bored to a depth of 2086 feet, yielding more than 300,000 gallons of mineral water daily. Many societies were organized (National Assn. of Baseball Players, American Numismatic Society, Ladies Christian Assn., later called YWCA). The first *medical college on the West Coast* was the Medical Department of the University of Pacific, at Santa Clara, Calif.

It was in 1858 that the first *overland mail* service was opened. The cross country mail delivery from San Francisco to St. Louis still took 23 days and 4 hours. In Chicago, people admired the memory of Louis Paulsen, German immigrant, who was able to play ten chess games simultaneously, without seeing the chessboard, against ten strong opponents, and won 9 games, and tied the tenth. *Gold* was found in *Colorado*, and many mining parties traveled to the Rockies and to Denver, the boom town, with the determination: "Pike's Peak or bust." Gold was also discovered near *Vancouver Island*, which resulted in a great influx of gold-diggers (50,000 in a few weeks) and in an organized government for the present British Columbia.

The industrial and technical development of the U.S. was satisfactory in 1858. Yet, while Birmingham, England, produced a billion steel pens that year, the U.S. made only its *first steel pen* in New Jersey. The first arctics (waterproof and cold-proof), made of rubber and cloth, were patented by Wales. The same year a *washing machine* was patented by Smith in Pittsburgh. The people of Lowell, Mass., admired the first ornamental *soda fountain* which was made

of Italian marble. Boston and New York began to collect mail in *letter boxes* on the street. Faber's factory for *rubber erasers* and rubber bands opened in Newark, N.J., while Whitney began to build wooden *baby-carriages*, with two wheels and a support in the front. New Orleans was the site of a yellow-fever epidemic which took the life of almost 5,000 persons. An epidemic of the *yellow jack* also broke out aboard the *Susquehanna*, traveling from Jamaica to the U.S., and the patients were cared for with so much humanity that Congress awarded its gold medal to Frederick H. Rose, a doctor in the British Navy.

PART 2: MEMORABLE LIVES

The classical antiquity provides us with a few heroes, leaders, and event-making personalities who fit the current year of our commemoration. *Solon* (d. 558 B.C.), the trader and amatory poet, was one of the seven wise men of Greece and the celebrated law-giver of ancient Athens. He died when *Darius* was born, the great Persian king, who extended and civilized his empire and became involved in a great struggle with Greece, which ended with his defeat at Marathon. About the beginning of the 4th century (408 B.C.), *Apollodoros*, the Athenian painter gained his reputation by the perspective and chiaroscuro of his pictures.

Roman Antiquity left us the lives of a general, a statesman, and a poet. The general was Marcus Claudius *Marcellus* (d. 208 B.C.) who defeated the Gauls, slaying their king with his own hand. He also defeated Hannibal at Nola during the Second Punic War. But, on opening a new campaign against Hannibal, Marcellus fell into an ambush while reconnoitering unwisely. He was slain, together with the chief officers of his army. On seeing his body, Hannibal said: "A brave soldier but a poor general." He made a stately funeral for him, and placed a golden wreath upon the urn containing his ashes. The statesman was Caius C. *Maecenas* (d. 8 B.C.), friend of Emperor Augustus who made him a sort of "minister

of literature" for his being the patron of Roman scientists and poets, including Virgil and Horace. At the end of his life, he reached the fatality of power that cannot last forever. Augustus seemed to forget him, and, with some bitterness, Maecenas wrote the hexameter fit to be his epitaph: "I care not for my tomb, Nature buries those whom Life has abandoned" (*Nec tumulum curo, sepelit natura relictos*). The poet was Quintus *Horatius* Flaccus (d. 8 B.C.), poet and satirist, son of a manumitted slave, schooled in Athens and trained in military service. He never had much ambition, remained poor, and poverty drove him to write verses. Soon, he became acquainted with Maecenas who took care of the poet and introduced him to the Emperor. Horace was a moral writer, of good taste and good sense, loving an easy but orderly life, avoiding the tumult and crowd, and being rather satisfied with refined conversation and a few chosen friends. "Seize the day" (*Carpe diem!*) he said, "and do not trust the future." His *Satires*, and three books of his *Odes* were translated into many languages and published in many editions all over the world.

During Valerian's persecution of the Christians, in 258 A.D., St. *Cyprian*, bishop of Carthage was beheaded, and St. *Lawrence*, deacon, was roasted alive on a gridiron. In the early 6th century (508 A.D.) was born Empress *Theodora* of Byzance. She was a daughter of the caretaker of wild animals in the circus of Constantinople. Being of some beauty, in her early life she earned her living as a strip-tease artist, a dancer and a harlot, according to historian Procopius. Then, Emperor Justinian took her as mistress, later as his wife and sharer of his throne. As a queen, she saved her husband's reign at time of a sedition of the Byzantians, and had great influence over the religious and political events of the empire. She died of cancer.

About 1258 A.D. died *Hugh Borgognoni*, of Lucca, surgeon of the Bologna school; he was a centenarian. He was able to cure wounds without suppuration, and with dress-

ing and wine alone he produced beautiful scars. As military surgeon he took part in the crusades. (His son, Teodorico, also was a surgeon, and a bishop.) In the early 14th century (1308) *Duns Scotus* died, one of the greatest medieval schoolmen, and a teacher of philosophy and theology at Oxford and Paris. The 15th century lost a great ruler in *Alfonso*, of Aragon, called the Magnanimous (d. 1458). He was a brave king, a man of learning, patron of literature, and the father of his people. He is considered the most accomplished sovereign of the 15th century. Once one of his vessels was about to perish, and he hastened in a small boat to the assistance of the crew, saying: "I would rather die with you than see you to perish."

From the famous renaissance scholars who died in 1558 we mention a few only. Olaus *Magnus*, archbishop of Upsala, wrote a history of the Northern people. Robert *Recorde*, physician to Edward VI and Queen Mary, obtained his fame by his avocation; he wrote the first English textbooks of mathematics, geometry, and astronomy. He was also the first to use the equation (=) sign. But his exceptional knowledge was not very profitable; he died in the debtors' prison. Jean François *Fernel*, physician to Henri II of France, relied upon his own observations rather than on the traditional doctrines of medicine. He described various new diseases (appendicitis, endocarditis, etc.). His practice and studies kept him busy 19 hours a day. No wonder that his annual income reached 12,000 livres a year. Jacob *Rueff*, Swiss obstetrician, wrote an admirable, often translated and reprinted booklet on the Conception and Generation of Man (Zürich, 1554) whose illustrations are of great interest as documents of historical embryology. John *Dee*, the English Faust, mixed magic with science, and as a practising alchemist he was always looking for gold and elixirs. As much a dupe as a deceiver he retired to Louvain where he died (1608) in poverty, leaving only a number of unpublished manuscripts behind.

Among the many memorable births of the year 1608 perhaps the foremost was that of John *Milton*, the greatest English poet. Since his vision began to fail, he dictated his great epic poem, the *Paradise Lost*, to his daughter. When the poem was published, the poet received £10 for its copyright. Giovanni Alfonso *Borelli*, of Napoli (b. 1608), was a universal genius. Besides medicine, he was also interested in mathematics, archeology, and meteorology. He studied the mechanics of blood circulation, muscular contraction and digestion, applying the laws of mechanics to motions of the animal body. While he originated the neurogenic theory of heart action, he also recognized that comets travel in a parabolic pathway. His contemporary was Evangelista *Torricelli*, mathematician and physicist at Firenze, pupil of Galilei, and the inventor of the barometer (1643). Oliver *Cromwell*, the Lord Protector of England, the great soldier and statesman, who prosecuted King Charles up to execution and to the abolition of monarchy, died of tertian malaria in 1658. He was buried in Westminster Abbey, but later his body was disinterred, and hung on the gallows (in 1661). One wonders what would have happened had he succeeded in his plans to emigrate to America. In the year of Cromwell's death, William *Paterson*, British financier and originator of the Bank of England, was born. From the tercentenary medical births we mention only three: Nicolas *André*, of Lyon, the father of orthopedics; Alexis *Littre*, French surgeon and anatomist, describer of a type of hernia, and of the mucous glands in the urethra (in 1700); and Francesco *Torti*, Italian doctor, who reported a disease which he called "malaria" (in 1718).

The medical world lost several outstanding men in 1708, but only a few can be recalled here. One of them, Joseph de *Tournefort*, made himself memorable by being the father of botany. Linné followed him in all main parts of his botanical system. François *Poupart*, French anatomist and surgeon, perpetuated his name in the ligament which plays a great role in the development of in-

guinal hernias. Among the notables born in 1708, William Pitt, the Elder, distinguished himself as an English statesman.

The entire medical world will remember the birthday (8 Oct., 1708) of Albrecht von Haller (died 1777), eminent Swiss physician, anatomist, botanist, physiologist, medical bibliographer, first-rate poet, and patriot. Though a native of Bern, he was called to Göttingen as professor of medicine and chemistry. While being there (1735-60), he published his *Icones Anatomicae*, with beautiful engravings; he also distinguished nerve impulse and muscular contraction, and described his irritability theory. During the last few years of his life, in a series of publications (each of which he called *Bibliotheca*) he listed and briefly described the contents of all the works, and their various editions, written by anatomists, botanists, physicians, and surgeons. They are still of great value to students of the historical literature of these specialties. Haller was a very prolific writer, publishing more than 1,300 papers, some of them moral essays and religious pieces. His poems were much admired for their elegance, and they influenced other contemporary poets. (Several years ago, an interleaved copy of these poems was lent to me by a Swiss scholar. On the blank leaves, bound between the printed German pages, there were some poems written in Hungarian in which I recognized the odes of Vörösmarty, famous Hungarian poet, who wrote the verses himself while being kept imprisoned at the rocky fortress of Kufstein in Tyrol for his alleged political "crimes".) In Germany, they will recall the memory of C. A. Cothenius (b. 1708), military surgeon and body physician to Frederick the Great during the Seven Years' War. Philadelphians may honor Thomas Cadwalader (1708-79), for his classical account on lead colic and lead palsy that was caused by a brand of Jamaica rum distilled through lead pipes. The monograph, entitled an "Essay on the West-India Dry-Gripes," and printed by Benjamin Franklin in 1745 at Philadelphia, is the first medical monograph published in the area of the

United States.

Two hundred years ago, in 1758, Richard William Vaughan, the first forger of the Bank of England notes, was executed. Lorenz Heister, famous German surgeon, died in the same year. He wrote a book on anatomy, and his *Institutiones Chirurgicae* appeared in many editions. He possessed a great number of silvery surgical instruments, and a library of several thousand volumes. The spiral folds in the neck of the gallbladder bear his name ("H-s valves"). The year 1758 gave birth to Maximilien Marie Isidore Robespierre who, upon reaching 35 years of age, became one of the actual rulers of France, having at one time complete control of the French revolution. Then, the pace of the guillotine grew faster. He was even nominated dictator, but soon he was declared an outlaw, and his miserable life ended under the guillotine. His contemporary in England was Horatio Nelson (b. 1758), British admiral and naval hero whose life we recalled in 1955 at the 150th anniversary of the battle of Trafalgar when a French sharpshooter's bullet hit his spine, and Nelson died. In the same year was born (in 1758) Jean Jacques Dessalines, Negro leader of Haiti where he was imported as a slave. After infamous cruelties, he drove out the French and established the Republic of Haiti, with himself as its emperor; but his cruelties and debauchery soon alienated his firmest adherents who then assassinated Emperor Jacques I.

In the United States, bicentennial birthday celebrations are due to James Monroe, and Noah Webster. Monroe (1758-4 July 1831), a lawyer, became the fifth President of the U. S., after a distinguished public career. The two terms of his administration are usually referred to as "the era of good feeling." Under his presidency, the independence of the Spanish American colonies was recognized. His celebrated principle, the Monroe Doctrine (Dec. 1823) states that "the American continents are henceforth not to be considered as subjects for future colonization by any European power." This really great man retired deep in debt, till he

found refuge with relatives in New York.—The name of Noah Webster (b. 16 Oct. 1758-d. May 1843) is known world-wide, and is associated with the first giant dictionary of the American English language (first published in 1828). His spelling book, popularly called "Blue-backed Speller," was kept in use for more than 100 years. He also wrote two volumes of a "Brief History of Epidemic and Pestilential Diseases" (1799). Among the 1758 generation of medical men, Franz Joseph Gall, father of phrenology, became the most influential in his times. Though his main work was a serious study of the anatomy and physiology of the nervous system, the 19th century crowd made a pseudoscientific fad out of it, and the "feeling of bumps" on the head became a popular pastime.

Two oldsters came to the end of their long lives in 1808:—Joseph Sam, a Negro of Jamaica, aged 140 years, and Marta Hannah, an Irish woman, aged 128 years. From the many eminent doctors who died in 1808 we can mention a few by name: Flajani, Mutis, Wrisberg, and in the U. S. the two eminent Philadelphians, John Redman (d. 19 March 1808) and William Shippen (11 July 1808). The latter was the Chief Physician of the Continental Army (1777-81). The list of illustrious foreigners of 1808 birth includes Honoré Daumier, French caricaturist; Thomas Cook, pioneer in tourism and founder of the travel bureau; Cardinal Manning, protestant convert; Carl Boeck, Norwegian dermatologist; Jean C. Chénu, French military surgeon and naturalist; Hugh Falconer, in the Bengal Medical Service; Sir William Ferguson, Scotch surgeon, with "the eagle's eyes, the lion's heart and the lady's hand"; Friedrich Stannius, German biologist; and Heinrich F. Wüstenfeld, German scholar and orientalist who wrote about medieval Arab physicians and scientists. Their contemporaries in the United States were such historical personalities as Jefferson Davis (d. 1889), president of the Confederate States of America, and Andrew Johnson (d. 1875), former tailor, and the 17th President of the U. S.; Enoch

Pratt (d. 1896), financier and philanthropist in Baltimore; Henry I. Bowditch, Boston physician and promoter of the public health movement in America; and Walter Burnham who performed the first (1853) successful abdominal hysterectomy in the U. S.

One hundred years ago, Europe mourned the loss of Count Radetsky, Austrian field marshal; Rachel, the tragic actress of Paris; Robert Owen, the founder of socialism in England. Owen was a cotton spinner who took good care of his many employees. He reduced the hours of work, raised the wages, built model houses for the workers, installed free education, and set up insurance funds. His adventures with the cooperatives and communistic settlements in Scotland and in Indiana, U. S., were complete failures, and they ended in a kind of moral depravation. From the many medical obituaries of 1858 we chose a few representative names: Pierre Bland, French clinician, promoter of iron pills for anemia; Sir Richard Bright, describer of chronic kidney disease; Robert Brown, Scottish physician and military surgeon who in 1831 discovered the cell nucleus, and also described the "Brownian" movements of particles; John Snow, pioneer anesthetist, who delivered Queen Victoria with chloroform in 1853 and in 1857; Ludwig Mauthner, founder of the first pediatric hospital (1837 in Wien); and Friedrich Schlemm, Berlin anatomist, describer of a channel in the human eye. Johannes Müller (1801-1858), professor of anatomy and physiology at Bonn and Berlin, deserves a few more lines since he was reformer of medicine and pioneer in many fields of physiology, biochemistry, histology, oncology, etc. His pupils were Virchow, Helmholtz, DuBois-Reymond, and other medical leaders of the 19th century. His inner dissatisfaction drove him to suicide.

Among the American notables who died in 1858 we mention only Matthew C. Perry (b. 1795), Navy officer, who commanded the *Fulton*, first American naval steamship (for which he is called the father of the steam Navy), and negotiated our treaty with Japan in the mid-19th century.

Many eminent persons, artists, scholars, medical men, etc., would have centennial birthdays this year. We may recall the tragic end of Archduke *Rudolf* of Habsburg (1858-89), crown prince of Austria, only son of Emperor Franz Josef. His romantic attachment to Baroness Maria Vecsera ended in a mysterious double suicide in the hunting lodge at Mayerling. The beautiful music of two Italian operatic composers, Ruggiero *Leoncavallo* ("I Pagliacci," etc.), and Giacomo *Puccini* ("Madame Butterfly, Tosca, La Bohème," etc.) will keep their names fresh and alive for centuries. The Alpine paintings of Giovanni *Segantini* (d. 1899) will be also enjoyed for ever. This man was the child of poor Italian parents, and became an orphan at an early age. He wanted to make his fortune in France, and set out upon foot; but he did not go far, and he was hired as a swineherd, working in the field in the wild mountains. One day he drew the finest of his pigs with a piece of charcoal upon a mass of rock. The peasants took the block of stone and young Giotto back to the village in triumph, and provided him an opportunity to study in an art school. He settled in the lofty mountains of Switzerland where he painted the plateaus, the highlands, the stillness and grandeur of Nature. He became the first master of line among the impressionists. Many of his paintings are collected in the museum at St. Moritz. Among the European authors of this generation the most outstanding was Selma *Lagerlöf* (d. 1940), Swedish novelist and poet, author of the Gösta Berling Saga, who in 1909 received the Nobel Prize for literature; she was also the first woman ever seated in the Swedish Academy of Sciences.

In the field of science and technology the same generation (1858) brought the world such outstanding Europeans as Rudolf *Diesel*, inventor of the internal combustion engine with the autoignition of fuel; Max *Planck*, who revolutionized modern physics with his quantum theory (1900); Ismar *Boas*, the gastroenterologist; Ernst v. *Bumm*, the gynecologist; Eugene *Dubois*, Dutch military surgeon and the discoverer of

Pithecanthropus erectus; Christian *Eijkman*, another Dutch military surgeon, who received the Nobel Prize for physiology (in 1929) as the discoverer of vitamin B; Sir Robert *Jones*, orthopedist of the first World War; Hermann *Oppenheim*, the neurologist; Richard *Pfeiffer*, German bacteriologist and Army surgeon, the discoverer of the influenza bacillus; Carl *Stratz*, anthropologist and the glorifier of the human beauty; and many others.

In the United States the foremost among the great men of the 1858 generation was Theodore *Roosevelt* (b. 27 Oct. 1858-d. 6 Jan. 1919), Republican president of the United States, the popular and beloved "Teddy" of the people, former leader of the "Rough Riders" in the Cuban War in 1898, reorganizer of the Civil Service, enemy of trusts and monopolies, explorer, African big game hunter, and a naturalist writer of considerable fame. (For his various activities, see our Calendars of former years, 1953-1957.) His contemporary was John Mervin *Carrère* (d. 1911), American architect who built the U. S. Senate and House of Representatives buildings, the Carnegie Institution of Washington, the New York Public Library, and in St. Augustine, Fla., the Ponce de Leon and the Alcazar hotels. George Washington *Gothals*, Army officer engineer, finished the Panama Canal, and served as quartermaster general during World War I. Michael I. *Pupin* (d. 1935), immigrant Yugoslav physicist, invented the Pupin spool, a ring-like device of inductive effect which made possible telephoning at great distances. Several American anthropologists and paleontologists belong to the same generation: Franz Boas, Carl Schuchert, William B. Scott, and Frederic Starr.

Among the centennial American physicians, Howard Atwood *Kelly* (d. 1943), leading gynecologist of his time, is the most unforgettable. He was one of the founders and organizers of Johns Hopkins University Medical School. He also invented diagnostic instruments, wrote several books, and compiled a biographical encyclopedia of American physicians. Henry *Koplik* (d.

1927), who practiced in New York, described the small bluish-white spots which are characteristic on the mucous membrane of the cheeks at the onset of measles (1898). Theobald Smith (d. 1934) was pathologist at Harvard, and later directed the Department of Animal Pathology of the Rockefeller Institute for Medical Research. He differentiated the bovine and human types of the tuberculosis bacterium, discovered the cause of Texas fever, and proposed toxin-antitoxin mixtures for immunization. John A. Fordyce (d. 1925) is recalled for the mouth disease which bears his name. Bernard P. Sachs (d. 1944), neurologist, left his name in history for the recognition of a familial type of idiocy which is associated with blindness ("amaurotic family idiocy").

PART 3: MEMORABLE BOOKS

The 1958 commemorative catalog of books starts with a 16th century best seller, a romance of chivalry, called *Amadis of Gaul*, which was published in 1508. It produced many imitators and continuations until people gradually became tired of these absurd stories of debased chivalry. In the same year, a great acquisition of literature was the finding of a manuscript copy of the first six books of the *Annals of Tacitus*. The manuscript was found in a monastery of Corvey. In the *Annals*, the brilliant Roman historian depicts the dark period following the death of Emperor Augustus, and leaves an unforgettable image of disaster and crime which was rampant under the first 3-4 emperors. Today, Tacitus is still regular reading matter in the higher classes of the European humanistic middle schools. Champier's *History of Medicine*, and Jerome Brunswick's *Book on Wound Surgery*, which were also published in 1508, acquired some importance in renaissance medicine.

Perhaps one of the most often translated and reedited books is the *Discourses on Sober Life* (Discorsi della Vita Sobria), which Luigi Cornaro, Venetian nobleman (1467-1566) wrote when he was 83 years old. When he was in the prime of his life, his health was very much impaired by in-

temperance; but, recognizing his faults, he adopted strict rules of meat and drink, and became better. He intended to offer the book as a guide to others for reaching a ripe old age. Indeed, he followed his rules so well that he almost became a centenarian. In 1608, Captain John Smith started writing his "*True Relation*", the first book written about America, though it was published in London.

The wits of London joined in 1708 to play a bad joke on Mr. Partridge, the maker of *astrological almanacs*. Under the pseudonym of Isaac Bickerstaff, Dean Swift published his "Predictions for the year 1708" in which he made a forecast that Mr. Partridge would die on March 29, about 11 o'clock at night, of a raging fever. When March 30 came, there was published an "Elegy on the death of Mr. Partridge." In vain, the poor man rushed into print with a denial of his death. Further grave treatises were published to convince him of the 'futility of urging that he was still alive. Indeed, even his name was erased from the list of the stationers who had an exclusive right to sell almanacs in England. Finally, after four years' non-existence, they let him resurrect and take courage to publish another almanac.

Goethe's *Faust*, its first part, was published in 1808. It is a grand dramatic poem about Man's ancient desire to break out of his physical limitations, a poem about his eternal search for a solution of the problems of life, Nature and Universe. He was writing this poem throughout his life, and it is almost a sort of autobiography of the creative genius of Goethe, who once wrote: "Nature is a grand organ on which our Lord God plays and the Devil blows the bellows." In the field of medicine, the most significant book of the year 1808 was Corvisart's "*Nouvelle methode . . .*" which introduced Auenbrugger's neglected method of percussion into clinical practice.

For modern medicine, the "*Cellularpathologie*" (Berl., 1858) of Virchow became the solid foundation. Another great current textbook of English-speaking students had its first edition in 1858; it is *Gray's Anatomy*

which reached its 25th English and 22nd American edition by 1932. The first book on birth control was published in America under the title "*The Unwelcomed Child*" (By H. C. Wright).

FIFTY YEARS AGO

Fifty years ago Mr. Asquith became the Prime Minister in Britain, and Mr. Lloyd-George the chancellor of Exchequer, and their administration forced the passage of the Old Age Pension Bill. In Germany, the socialists demanded universal suffrage, and serious street fights developed in Berlin. Kaiser Wilhelm became the bad boy of foreign policy because he made free utterances which the English did not like. Congo was annexed to Belgium; in fact, it had been a personal enterprise of Leopold since 1885. Austria annexed Bosnia and Herzegovina, which led to the first trouble with the Serbs. There was a marked revival of Panslav agitation, and the Narodna Obrana propagandist society was established in Serbia. At the same time, tension began to develop between Austria and Russia,—all premonitory signs of the conflagration to come in World War I. In Portugal, King Carlos was assassinated, and Manuel II ascended the throne. In Turkey, the Young Turks rebelled and came to power. Crete proclaimed union with Greece. In South Africa, the constitutional convention met at Capetown, and the idea of a union generally developed. Conflict was seen everywhere else, between Persia, and Turkey, Venezuela and Holland, China and Japan. The Mediterranean basin was visited by one of the most devastating earthquakes in centuries when Messina, Reggio and many small towns in Sicily and Calabria, were destroyed and about 200,000 lives were lost.

Fifty years ago, the Currency Bill passed in the U.S. Taft was nominated by the Republican Convention, and he was running for the presidency against the Democrat William Bryan. The Federal Workmen's Compensation Insurance Law was approved and became applicable to certain civilian employees. Springfield, Ill., witnessed a race riot and

lynching. The financial panic of 1907 continued into 1908. There was widespread unemployment, and demoralizing low wages for workers who were not members of strong unions. The breadline at the Bowery Mission in New York was growing longer and longer.

With the spreading of *automobile* driving the general comfort of Americans was improving. In 1908, however, the mayor of Cincinnati appointed a commission for licensure of people who wanted to drive automobiles. No woman is physically fit to run an automobile, the naive mayor stated. Others fought the invasion of their quiet by the speed and noise. The Massachusetts Legislature authorized Nantucket to exclude autos from the island. Ford's Model T was priced that year at \$850 (twenty years later its factory price was only \$310). In February 1908, an automobile race started around the world, beginning from Broadway in New York City. The route was *via* Seattle, Yokohama, and Paris. With a daily average of 152 miles, and the longest day's run of 420 miles, the race was finished in 170 days of which only 82 days were actual travel.

"Old Debil Tobacco" also made its progress in America. Newspapers in 1908 noted that *women began to smoke* at public places in San Francisco. In the theater lobbies, men were then menaced not only by hatpins but by burning cigarettes. In New York, however, the Sullivan Ordinance made it an offense for the manager of public places to allow women to smoke in the establishment. The country was also in uproar against the *evil of liquor*. On the first of January, a state-wide prohibition law went into effect in Georgia. Soon the Baltimore and Ohio Railroad Company also demanded that all employees who run and direct the trains must be total abstainers. Teetotaling was also requested for the employees of the Henry C. Frick Company, a subsidiary of the U.S. Steel Corporation. In April, Worcester's (Mass.) 76 saloons were closed by local option, and many others in other Massachusetts towns.

The cult of motherhood became more in-

tensive, and the first city to inaugurate Mother's Day was Philadelphia in 1908. By this time, "mother" was wagging in narrow sheath skirts, a fad first appearing at the Paris races, with huge Merry-Widow hats some of which were roosts for dead birds, with chenille dotted veils, and fish-net stockings, thus making herself the topic of song-writers:

"Katie Keith, she wears a sheath
With very little underneath . . ."

She spent some time in the long, narrow movies which were converted from former nickelodeons, and were called kinetoscopes, providing the *daily pleasure* to more than 200,000 persons in New York alone. Or, she went to watch Isadora Duncan who, in a short, loosely hung Grecian dress, with bare feet and arms, danced a series of Greek dances from Gluck's *Iphigenie in Aulis*.

The streets of 1908 reverberated the melodies of the usual *songs* parodizing the ladies' dresses ("Mary took the calves to the dairy show"), songs of children, sentimental flower songs. Perhaps the best remembered of this musical crop are the song of "Katie Casey", the girl who became a baseball fan, and asked her beau: "Take me out to the ball game." Out of the 1908 favorites we are still humming, "By the Light of the Silvery Moon." The last line of the following lyrical complaint of two theatrical girls became the universal phrase of the day:

"The way folks talk about us two,
For the smallest thing we do . . .
'Nuff to make a girl feel blue.
Ain't it awful, Mabel?"

American technology showed advancements on various fields. The *first skyscraper*, the 47-story Singer Building, was erected in New York City. The excavating of the Pennsylvania Railroad *Tunnel under the Hudson River* was completed early in the year, and the tunnel opened in February. Aeronautics was still in its baby boots, but Edison already foretold the success of the plane of the future, one which will screw itself vertically into the air. Glen H. Curtis, in his "June Bug," was able to fly ONE

mile on the 4th of July, and thereby won the first *Aeronautical Trophy* awarded by the *Scientific American*. The first *airplane accident* killed Lt. Selfridge. Wilbur Wright found financial backing, and brought his aeroplane to Europe where he continued his experiments at Issy and Le Mans. On 10 October, he was in the air one hour and 9 minutes, covering 70 kilometers, the first time a man could remain so long in the air in a machine heavier than air. In Europe, Zeppelin improved his airship, and in the U.S., the *first dirigible balloon* was constructed by Curtis, and demonstrated in August at Fort Myer, Va. It was purchased for the Army Signal Corps. The year also saw the first *airship disaster* at Berkeley, Calif., when Morrell's airship, with the inventor and 15 passengers in it, collapsed and exploded.

Fifty years ago, Cook claimed that he discovered the *North Pole*, and Peary began his own Arctic travel on the Roosevelt. In Chicago, the first electric indirect lighting was demonstrated. In New York, *sky advertising* on a box kite started over Broadway. *Automation* was also spreading. The first confectionary machine was made at Racine, Wis., and it could make 40 candy suckers in a minute (the owner was afraid that it would make more in a week than he could sell in a year).

A number of institutions and societies were founded. In 1908 the corner stone of the *Panamerican Bureau* was laid. The first saving bank life insurance was established at Whitman, Mass. The first *child hygiene bureau* opened in New York, and the first *school of journalism* anywhere in the world began to function at the University of Missouri. Among the scientific societies here and abroad we could mention many (Amer. Soc. of Clinical Investigations, Amer. Soc. for Pharmacology, etc.)

In 1908, the world of science was enriched by several important contributions. *Rutherford* received the Nobel Prize for chemistry, an award for his efforts to prepare the basis of the present atom physics, and the modern type of transmutation of metals. *Onnes*

succeeded in liquefying the helium gas. Wheaton discussed the possibility of *gas warfare*. Minkowski introduced his 4-dimensional *space-time* hypothesis. Medical laboratories produced experimental ticks by deficient diet (Finlay), detected the regulator of calcium metabolism in the parathyroid (MacCallum), etc. The functions of the brain cortex were mapped out (Brodman). Physicians first learned of obliterating inflammation of the arteries (Bürger), osteochondritis of the tibia and tarsal scaphoid (Schlatter and Köhler), and Murphy's drip. The Tropical Disease Bureau was established in London, and the *U. S. Navy Nurse Corps* was organized. Chicago introduced compulsory pasteurization of milk, and Jersey City began to *chlorinate* its water supply. Having discovered the bug of southern laziness in the hookworm disease, Dr. Stiles moved for the regeneration of the South, and, with the help of others, was able to obtain in 1908 a million dollars from the Rockefellers to organize a future *campaign against hookworm* and to improve rural living conditions south of the Mason-Dixon line.

The world of 1908 mourned the death of many notables; just to mention a few: Antoine Henri *Becquerel*, Nobel-Prize winning French physicist, and discoverer of radioactivity (1896) in the uranium; Friedrich v. *Esmarch*, great military surgeon and sanitarian who introduced the first-aid bandage on the battlefield; Friedrich *Bezold*, the otologist; Albert *Hoffa*, German orthopedist; Franz *Leydig*, German anatomist; Joseph v. *Mering*, internist; Henry R. *Silvester*, inventor of a type of artificial respiration; Hermann *Snellen*, whose test types for visual acuity are still used everywhere.

Fifty years ago the U.S. lost Grover *Cleveland*, the 22nd President of the country (from 1885 to 1888). *Mrs. William Astor* also died at her Fifth Avenue home. With her passed "Society" in the old American sense, a social dynasty as well as the idea of hereditary social supremacy. Her box No. 7 in the Opera House was a social throne, and her annual balls and several large yearly dinner parties were sought for by all

the "Astorbilt"s, the people who pretended to have some social importance. Edward *MacDowell*, foremost American composer was another great loss of the year since, with his symphonic poems and orchestral suites, he was the first to give American music a reputation in the world. We still find delight in the various adventures and doings of "Uncle Remus," the classical creature of Joel C. *Harris*, and admire also the poems of Edmund C. *Stedman*, who, though a member of the New York Stock Exchange, could find a few quiet hours in his prosaic occupation for the cult of his favorite Muse. The first medical prize of this year's commemoration goes to the Swiss immigrant, Dr. *Nicholas Senn* (1844-1908), leading surgeon of his days and father of aseptic surgery (1889). He was Surgeon General of the Wisconsin National Guard, the founder and the first president of the Association of Military Surgeons of the United States.

* * *

Anywhere we open the pages of history we find examples to imitate and examples to avoid. From the beginning to the end, however, human history is moving in spirals, and the same situation is never exactly repeated. Thus, each life, each new generation has to struggle through the peculiar difficulties of its own times.

The Universe is an adventure, and any historical retrospect will prove that, though this world may be a place of many defects, victory awaits those who are able to lift themselves above the crowd, and who can potentiate and stimulate every energy of their life by Faith in the ultimate success of Humanity, the faith which makes even the tomb of the ancient Greek shipwrecked mariner a shrine of human destiny and converts his epitaph into a beam of light, thrusting its shine of hope into the dark unknown:

"A sailor buried on this shore
Bids you set sail;
Full many a gallant bark, when I was lost,
Weathered the gale."

(CROMER E. B. *Greek Anthology*)

The Courageous Medics of Anzio

By

COLONEL ROLLIN L. BAUCHSPIES, *Medical Corps, U. S. Army**

I

Dedicated to All Those Who Were There

FOREWORD

The long twenty months of the Italian Campaign of the Fifth Army provided a thorough test of the efficacy of our medical service. The rugged terrain, weather of every imaginable type, and a determined enemy joined constantly to challenge the worth and stamina of our personnel and equipment. The Anzio Beachhead without doubt provided the supreme medical test of the campaign. In these pages so ably written one finds the true record of the accomplishments of our Medical Department at Anzio. No one is better qualified than the author to tell the medical story of Anzio, yet through modesty he has left unwritten volumes of incidents that would be necessary to make the history complete in every detail.

Those who read this history will have lost its real significance if they fail to grasp the all important place that the field medical service and its leadership plays in war. The high quality of medical leadership at Anzio constantly paralleled that of the high command. It was no accident of selection that brought Colonel Huddleston and later the author to Anzio. Both of these fine medical officers had established themselves as outstanding leaders by demonstrated ability on the battlefield. This ability was developed as the result of long individual preparation and training. Not the least part of that preparation came from the study of past events in war. This history now takes its place as a text for those who would aspire in future wars to high medical command. In studying its pages one will find on each the lessons of great medical leadership amply displayed. Those lessons represent the true value of this account.

As one who had intimate knowledge of the

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BRIG. GEN. JOSEPH I. MARTIN, MC, USA
(Later Major General)
Surgeon, Fifth Army, 1943-1945

events at Anzio I feel with the author that our jobs were made easy by the unbounded courage and untiring devotion to duty of the greatest group of medical men and women ever assembled on any field of battle. It is to those sterling individuals, both living and dead, that all credit for the successful accomplishment of our mission at Anzio must be given.

JOSEPH I. MARTIN
Major General, Medical Department
Surgeon, Fifth Army
1943-1945

(General Martin died at his home in Santa Rosa, Calif., April 13, 1956.)

INTRODUCTION

On the following pages, it is intended to record briefly some of the activities of Medical Department personnel during the Anzio campaign in Italy, 22 January 1944 to 23 May 1944. A complete account of the valorous performance of duty by the individual aid men and litter-bearers, the battalion and regimental surgeons, and the doctors, nurses and enlisted technicians of the hospitals, all of whom served the troops of the VI Corps dur-



COLONEL ROLLIN L. BAUCHSPIES, MC, U. S. Army

ing this bitter struggle, is not available. It is proper that the story of their heroic self-sacrifice be told. In performing their duties of evacuating and treating the sick and wounded, this group of military personnel suffered the ravages of a relentless enemy and endured the hardships of an unpropitious winter.

Primarily, this narrative was to be a personal account of my role during the Anzio campaign. Supplemented by the photographs I had taken and by those obtained from my associates and other sources, this account was to have been written solely for the benefit of my family. As I progressed in writing this story of my experiences with the medical service at Anzio, I was urged to compile this account for all those who participated in this campaign, and for those who might be interested in the accomplishments of the Medical Department. Rather than to describe these unprecedented events in the third person I have continued it as a personal description. What I have written and expressed are my own opinions and they should not be construed as reflecting official views of the Department of the Army or the De-

partment of Defense unless specifically indicated.

Except for the first three weeks of the campaign, I was present on the beachhead for the duration of the operation. In the performance of my duties as the Surgeon of the VI Corps, I was enabled to observe the attainments of all medical units, both American and British. In this account I have endeavored to describe as accurately as I could, the events as they occurred. I have included the observations which I had officially reported in the historical record, "Medical Services of the VI Corps—1944." Verification of events was obtained from the official histories of the several medical units and from personal accounts of the participants. I have borrowed freely from the official description of the "Anzio Beachhead" campaign, published by the Historical Division, Department of the Army, to obtain the chronology of the tactical situations and for the splendid maps which portray the situation as it existed during the occupation of the beachhead. I am indebted to the following commanding officers of medical units who furnished me with much authentic material concerning their respective organizations: Colonels Henry S. Blesse, Donald E. Currier, Paul K. Sauer, George T. Wood and James H. Forsee, and Major Robert W. Newman; to 1st Lieut. Sidney Hyman who wrote the "Medical Story of Anzio" in 1944 as historian for the Medical Section, Hqrs. Fifth Army; and to Tech. 5th Grade Herbert E. Laager, who was a member of the Medical Section, Hqrs. VI Corps. The use of the drawings to illustrate this narrative, copyrighted 1944 by United Feature Syndicate, Inc., is by permission of Mr. Bill Mauldin.

I fully appreciate the opportunity that had been given to me and the confidence placed in me by Brigadier General Joseph I. Martin, Medical Corps, Surgeon, Fifth Army, when he assigned me the duty as the Surgeon for the VI Corps at a time when the situation on the Anzio beachhead was at a critical state.

I am very much indebted to my wife, who through her tireless efforts obtained the strictly rationed photographic film in the States and sent it on to me, enabling me to document this narrative with illustrations of the activities of the medical units.

I am well aware that the descriptions I have made do not adequately depict the tense days and nights on the Anzio beachhead; nor have I sufficiently described the fortitude and courage of those who carried on the mission of mercy during this bloody campaign. Those who received succor for their wounds can testify to the efficiency, the integrity and to the indomitable spirit of the courageous medics at Anzio.

ROLLIN L. BAUCHSPIES, Col. MC, USA

THE UNPRECEDENTED achievement by the Medical Department of the Army during World War II is now a matter of statistics and living exemplifications of those whose lives were saved, wounds healed, and broken bodies repaired and restored. This branch of our military forces accomplished its mission and capably fulfilled its obligation so succinctly expressed in the motto of the Medical Field Service School, "To Conserve Fighting Strength." Of nearly 700,000 wounded there were only 29,000 who died of wounds; and about 600,000, six out of seven, were able to return to duty. Much of this success has been attributed to the development and widespread use of new drugs and modern medical techniques. While such means of saving lives were indispensable, not the least factors in the attainment of this preeminent feat were the stamina, integrity, courage and resourcefulness of the individual doctor, nurse and Medical Department technician who evacuated and treated the sick and wounded on the field of battle. Too readily is forgotten the unarmed aid man and litter-bearer who unhesitatingly accompanied the combat troops into battle and shared their privations and danger; the doctors who fearlessly performed intricate and delicate operations under most adverse conditions and with limited equipment; the nurses who efficiently cared for their patients while their hospitals were being shelled and bombed; and, the administrative and technical personnel both officer and enlisted who always have an important and essential role in assisting and supporting the professional staffs as well as providing supervision, control and services. Nor was this deed accomplished without loss. The record shows that combat losses of Medical Department personnel were 4,000 killed in action or died of wounds, and 15,000 wounded in action. In no other theatre of the war was the resoluteness and fortitude of medical personnel more tried or indomitable courage greater displayed than during the early months of 1944 on the Anzio beachhead.



"Ya don't git combat pay 'cause ya don't fight."

By permission

FIG. 1

2

Operation "SHINGLE," the code name for the amphibious, end-around maneuver, planned to weaken the German Gustav line which checked the Fifth Army offensive at Cassino, became a stalemate on the narrow segment of Roman coastal plain around Anzio and Nettuno. Placed on the defensive for the first time, it tested and proved the stubbornness and staying power of the Allied soldier. Hitler personally had directed that the "abscess of Anzio" be removed from the flank of the German forces in Italy. Throughout the course of four, bitter, heart-breaking and nerve shattering months the Allied forces comprising VI Corps held on against a numerically superior enemy and withstood the murderous siege of the beachhead. The short stretch of coast known as the "Anzio beachhead" became the scene of one of the most courageous and bloody dramas of the war.

3

I did not participate in the planning phase



FIG. 2

nor in the initial assault of the Anzio operation. However, my assignment as Surgeon, VI Corps, early in February 1944, enabled me to observe and direct the activities of medical installations during the valiant defense, the ensuing protracted siege and the eventual breakout from the beachhead. At the time that plans were being formulated and preparations made for this maneuver I was in command of the 16th Evacuation Hospital, a 750 bed, affiliated unit from the Michael Reese Hospital in Chicago, Illinois. Attached to the 36th Infantry Division, the assaulting forces in the U. S. sector, we had come ashore on D-Day, 9 September 1943, on the bloody beaches of Salerno as part of the supporting service troops of the VI Corps which, together with the British X Corps, made the amphibious invasion of the Italian mainland. After our initial action during the establishment of the beachhead we followed and supported the offensive of the Fifth Army as it drove northward through Italy. During Christmas week we had moved forward from Caserta and set up our hospital with 1,100 beds at Vairano, near

the junction of Highways Nos. 6 and 85, the most forward hospital on the Cassino front.

4

It is not my purpose in writing this narrative to discuss the strategic importance of the Anzio campaign, other than to identify its place in the struggle to drive the German armies out of Italy. The tactics and strategy are best explained by those who directed the action of the Allied forces. It was a "calculated risk." This strategy was considered by the Allied leaders as soon as the German intentions in Italy became clear. As early as 8 November 1943 General Alexander ordered the Fifth Army to plan an amphibious landing on the west coast of Italy in the German rear with a target date set for 20 December.

By mid-December the Fifth Army was fighting its way through the forward enemy defensive positions of the Winter line, a series of tangled hill masses and a broken mountain divide rising abruptly from the coastal plain and blocking access to the Garigliano and Rapido river valley, Fifth Army

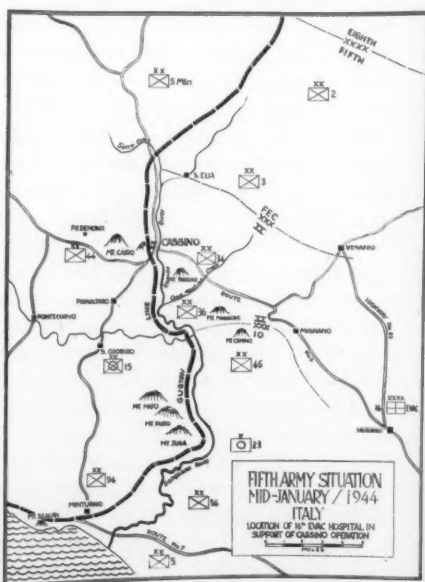


FIG. 3

troops were opposed by tenacious German resistance and the difficult terrain. By the end of the month the Winter line had been crossed but the offensive was stopped along the banks of the Garigliano and Rapido river, just short of Cassino, the gateway to the Liri valley.

On Christmas Day, Allied military leaders drafted a plan for an amphibious landing below Rome with the initial assault to be made between 20 and 31 January 1944. This assault from the sea was to be coordinated with a drive by Fifth Army from the south and had as its objective the capture of Colli Laziali, blocking enemy supply routes and threatening to cut off the German troops holding the Gustav line. Allied leaders believed that the Germans lacked sufficient strength to meet attacks on two fronts and that they would be forced to move troops northward from the Cassino front to meet the grave threat to their rear. Although these results were not achieved, the heroic action at Anzio was not fought in vain. It facilitated the drive on Rome and the liberation of the Eternal City in the spring when Fifth Army had been reinforced sufficiently to resume the offensive.

5

The U. S. VI Corps was selected by General Mark Clark, Commanding Fifth Army,

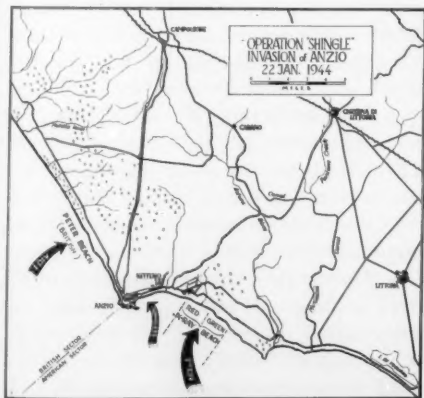


FIG. 4



FIG. 5. Nettuno. Showing sea wall and beaches east of the town.

to make the amphibious landing and employed British as well as American troops. The assault group consisted of the U. S. 3rd Infantry Division (Maj. General Lucian K. Truscott, Jr.), veteran of landing operations at Casablanca in French Morocco and in Sicily; the 1st British Division, also a veteran of North Africa and which was part of the British Eighth Army; the 46 Royal Tank Regiment; the 171st Tank Battalion; the 509 Parachute Infantry Regiment; Commandos, Rangers, and other supporting and service units. These troops were withdrawn from combat as all were engaged with the enemy. This included the medical units which were selected to support the invasion.

Medical units chosen by Brigadier General Joseph I. Martin, Medical Corps, the Surgeon of the Fifth Army, were the 93rd (Colonel Donald E. Currier, M.C.) and 95th (Colonel Paul K. Sauer, M.C.) semi-mobile (400 bed) and the 56th (Colonel Henry S. Blesse, M.C.) (750-bed) Evacuation hospitals; the 2nd Casualty Clearing Station (British CCS); the 33rd Field Hospital (Lieut. Colonel Samuel A. Hanser, M.C.); the 12th Field Transfusion Unit (British FTU); Detachment, 2nd Auxiliary Surgical Group; the 549th Ambulance company and an advance section of the 12th Medical Supply Company. The only organic medical troops of VI Corps was the 52nd Medical Battalion (Lieut. Colonel Henry Johnston, M.C.). After transferring their patients and responsibilities to other medical installations,

all of these units were withdrawn from their forward positions to a staging area about Caivano for reorganization and re-equipping. The nurses of the several hospitals and surgical teams were sent to a staging area at Bagnoli as they were not to accompany their units on the initial assault; the nurses were scheduled to arrive on the beachhead on D plus 6.

As this was to be a combined American-British operation many British staff officers were attached to the VI Corps Headquarters. Lieutenant Colonel Thomas F. Briggs, Royal Army Medical Corps, Banbury, England, a veteran of two years service on the island of Malta, with his enlisted clerk, were attached to the Medical Section. Colonel Briggs became the ADMS (Assistant Director of Medical Service) of the Corps.

On 14 January, the VI Corps Surgeon, Colonel Jarrett B. Huddleston, Medical Corps, conducted a conference which was attended by his staff, the division surgeons, and the commanding officers of all medical units participating in Operation SHINGLE. The medical problems contingent to the invasion were discussed and a medical plan formulated. The 33rd Field Hospital with the 12th FTU attached was to support the 3rd U. S. Division and the 2nd CCS the 1st British Division during the assault of the beachhead. The 93rd and the 95th Evacuation hospitals were to establish their units as soon as sites became available; tentative locations being selected from a study of maps and aerial photographs of the target area. The 52nd Medical Battalion was initially attached to the Beach Group (540th Engineer Regiment) and was to effect the beach evacuation. Litter-bearers of the 52nd Medical battalion were attached to the Ranger force. The 56th Evacuation hospital, with the nurses of other units, was scheduled to arrive on the beachhead by D plus 6. Ten surgical and two shock teams from the 2nd Auxiliary Surgical Group were initially attached to the 33rd Field Hospital for the operation. Four days prior to the landing two of these surgical teams were attached to the Ranger battalion to support it during

the assault. These latter teams were to rejoin the Field hospital as soon as it was established on the beach. On 21 January, four surgical teams of the 2nd Auxiliary Surgical Group were placed on temporary duty with four British Hospital Carriers to evacuate and treat casualties during the early phase of the beachhead landings.

Loading of equipment and personnel was accomplished by 20 January and the convoy sailed at 0500 hours on the following day. The convoy sailed out of the harbor at Naples south around Capri and took a long roundabout course to avoid German minefields and to deceive the enemy as to its destination. The voyage to the target area was made without incident.

6

At five minutes past midnight, on 22 January (incidentally on my birthday) the assault convoy of some 250 ships of various types and loaded with 50,000 men, 5,200 vehicles and ten days of supplies, dropped anchor in the murky blackness off Cap Anzio.

It was known that the Germans had anticipated an amphibious landing but they had no previous knowledge of where the invasion was to be made. They had a flexible and ambitious program to meet the threat as far north as Civitavecchia.

There was no preliminary barrage from the escort ships of the convoy to soften the beach defenses. Ten minutes before H hour (0200), there was a short, terrific rocket bombardment to disorganize any possible ambush and to explode mine fields along the beach. No answering fire came from the shore. The first assault wave hit the beach and reached the cover of the dunes but there was no enemy to oppose them. The landing was made without resistance—the enemy had been taken completely by surprise. The invaders quickly established themselves on shore. Brushing aside the few enemy patrols encountered, the Allied troops pushed rapidly inland and reached their initial phase line where they dug in, prepared to repel any counterattack. The Ranger force swiftly seized the port of Anzio before

the Germans had time to demolish its facilities. By noon of D day VI Corps had reached its preliminary objectives ashore.

Casualties were light: 13 killed, 97 wounded and 44 captured or missing. The wounded were readily cared for by elements of the 52nd Medical battalion attached to the Beach Group. By midnight, some 36,000 men, 3,200 vehicles and large quantities of supplies were ashore. During the first twenty-four hours ninety per cent of the convoy had been unloaded.

The 3rd U. S. Division Clearing Company and the 2nd Platoon, 33rd Field Hospital (Captain Robert W. Newman, Medical Corps, Memphis, Tenn.) came ashore on the afternoon of D day. The field hospital platoon was delayed in landing as the LST which was conveying it was damaged earlier in the day during an enemy air raid. The Clearing Station and Field Hospital were set up on Green Beach, southeast of Nettuno and were in operation by H plus 16 (1800 hours). The two surgical teams supporting the Ranger Force had landed at 0830 hours and joined the field hospital. The following day one of these surgical teams was attached to the 2nd CCS and remained with the British unit for the next four months. By morning of 23rd January the field hospital had received more than thirty patients.

The 2nd CCS, the 93rd and the 95th Evacuation hospitals were not unloaded until the afternoon of D plus 1. In accordance with the VI Corps medical plan, each unit proceeded to its predetermined initial position. The 2nd CCS, supporting the 1 British division which landed over Peter beach north of Anzio, occupied a Tuberculosis Sanatorium northwest of the port; the 93rd Evacuation hospital took over some buildings in the port town and the 95th Evacuation hospital erected a tent hospital on the grounds of the Infant Sanatorium east of Anzio. The VI Corps Medical Section operated in the Corps Headquarters located in the Hotel de Ville in Nettuno. The remainder of the 33rd Field hospital, with the attached British 12th Field Transfusion Unit and surgical teams, arrived on the beachhead on D plus 2



FIG. 6. Nettuno. The Gulf of Anzio, looking towards Anzio.

and bivouacked in the vicinity of the field hospital established by the 2nd Platoon on Green beach.

Although the Anzio landing and initial Allied build-up were virtually unopposed by German land forces, the enemy reacted swiftly to meet the emergency. The first retaliatory measure was "hit and run" tactics from the air which were comparatively light on D day. The enemy quickly assembled his air power, and bombing attacks increased in intensity on 23rd January and continued regularly during the entire beachhead campaign. The chief effort was made to destroy the port of Anzio and prevent supplies from coming ashore.

At dusk on 24th January, three British Hospital Carriers, HMS ST. DAVID, HMS ST. ANDREW and HMS LEINSTER, left the Anzio harbor area and moved seaward for safety during the night. These ships were scheduled to continue the loading of patients for evacuation from the beachhead in the morning. As these ships moved out to sea they sailed in a line three to five miles apart and cruised with all of their lights on and their conventional Geneva Red Crosses were brilliantly illuminated. There could be no mistake as to their identity.

The crews and personnel on board the hospital carriers witnessed a heavy enemy aerial attack which struck the port of Anzio and the ships in the harbor at 1945 hours. Several of the bombers flew over the hospital ships and dropped flares. The flares were immediately followed by bombs. The

HMS ST. DAVID received a death blow and within five minutes had rolled over on its side and rapidly sank. On board HMS ST. DAVID at the time of the attack was a crew of 144, 75 patients, an American surgical team from the 2nd Auxiliary Surgical Group composed of one medical officer, two nurses and an enlisted technician, and three wounded enemy prisoners of war. Fortunately most of the patients were ambulatory and their rescue more readily affected by the heroic efforts of the personnel from HMS LEINSTER which had also been struck by a bomb during the attack. Of the 226 personnel aboard the carrier, HMS ST. DAVID, 130 were saved including the two nurses of the surgical team, 2nd Lieut. Ruth Hindman, Army Nurse Corps and 2nd Lieut. Anna Bess Berret, Army Nurse Corps, Major John E. Adams, Medical Corps, the team captain, was lost when he returned below deck to evacuate patients and to locate his missing enlisted Technician, Tech. 5th Grade, Theron McCombs. Major Adams was decorated posthumously in recognition of his heroic efforts.

The following account was given by 2nd Lieut. Anna Bess Berret, Army Nurse Corps, one of the survivors of this disaster:

"I was on board the British Hospital Carrier, HMS ST. DAVID. It arrived off the coast of port Anzio, Italy, about 1000 hours on 23 January, approximately one-half mile off shore. Patients started arriving at about 1100 via motor boats which had been launched from our ship and LCI's coming alongside. Our team consisting of Major John E. Adams, Medical Corps, Lieut. Hindman, Army Nurse Corps, Corporal McCombs and myself began operating and by 0430, 24 January 1944 there were 78 patients on board who had received necessary surgery. We had moved out of the harbor for the night and came back that morning arriving at approximately the same distance from the shore around the same time (1000 hours). No patients were taken aboard that day as it was too rough to send our own boats out and none were brought aboard per LCI's. Shortly after lunch the air raids began and continued throughout the entire afternoon. I was on deck most of the time and war ships were firing on all sides of us. At about 1730 we started out to sea for the night. We were told that there was a convoy coming in that was being raided, but we passed quite near it

with our lights out, without being harmed. After we were four miles out the ship's lights were turned on. At about 1900 I went to my cabin and found Miss Hindman there asleep. At 2000 we were about 20 miles off shore with all the ship's lights on. I was suddenly awakened by a terrific explosion. Almost simultaneously all lights went out. Miss Hindman and I grabbed our life belts and ran to the upper deck where we saw Major Adams supervising the evacuation of patients. We said that we were going up to the next deck where the life-boats were. As I started up the stairway I saw Major Adams going back to the ward to get some more of his patients who were still there. If he had come with us then he would have had time to get into the life-boat because we immediately jumped into a life-boat which somebody started lowering. After it was lowered about a foot it started turning over. I heard someone say, 'The ship is sinking, jump!' I jumped into the water calling to Miss Hindman to follow me but I couldn't see her. When I came up I could just see the last end of the ship going down. I tried to swim away from the ship so that I would not be pulled down by the suction. In a few minutes someone near called, 'Here's a raft,' and I reached out and caught it. Gradually more people started hanging on until there were about twelve of us including one patient who was pulled onto the raft. We had two flashlights among us and took turns waving them as our arms became tired. We were hoping that someone in one of our life-boats would see the lights. After being in the water for about an hour we saw the lights of the British Hospital Carriers, HMS LEINSTER and HMS ST. ANDREW. We kept waving the lights and calling until a life-boat from the British Hospital Carrier, HMS LEINSTER, came to us. The boat stayed out for some time after we got aboard picking up other survivors. When we arrived at the ship we were told to climb aboard the rope ladder as the sea was too rough to bring the boat up. Everyone climbed except the patients who were pulled up in the boat in spite of the difficulties. I was taken to the resuscitation ward."

Since all of these hospital carriers were observing the rules of the Geneva Convention by being brilliantly lighted, far removed from the ships in the harbor, and their identity further revealed by the enemy flares the conclusion that this attack was deliberate can readily be assumed. It was reminiscent of an earlier bombing attack off the coast of Salerno when the British Hospital Carrier, HMS NEW FOUNDLAND, transporting nurses of the 16th Evacuation Hospital from

North Africa to join their unit in Italy, was struck by an aerial bomb, set afire and eventually sunk.

7

After a few days operation at their initial sites it soon became apparent that the locations of the evacuation hospitals were untenable. Repeated bombing attacks on Anzio, falling flak from our own anti-aircraft guns and heavy enemy artillery shelling aimed at the port caused some casualties among hospital personnel. On 24 January Sergeant Louis E. Bliss, 93rd Evacuation hospital, was struck in the head by a flying shell fragment. It is believed that he was the first casualty among the hospital personnel on the beachhead. The Corps Surgeon reconnoitered the beachhead for a more favorable area for the establishment of the hospital units.

8

It took only a few days for the enemy to contain the beachhead force. By the end of D day the Germans had 20,000 troops available to drive on the beachhead. Two days later they had twice as many and outnumbered the VI Corps troops. In a few days there were 70,000 German crack combatants to check the Allied invasion. As a result, the beachhead was not enlarged and defensive positions were prepared to meet an enemy thrust calculated to drive the Allied force back into the sea.

9

The Corps Surgeon selected a site for the evacuation hospitals about three miles east of Nettuno on a flat, sandy stretch of the beach. The topography of the area, from the Italian coast line about Anzio and Nettuno to the Alban hills and Lepini mountains, did not afford any natural cover or protection. The coastal plain was reclaimed waste-land; flat, and with the exception of the western beachhead sector, was devoid of woodland. Defilade was non-existent. There was no other alternative than to place the hospitals out in the open terrain, removed as far as possible from military objectives

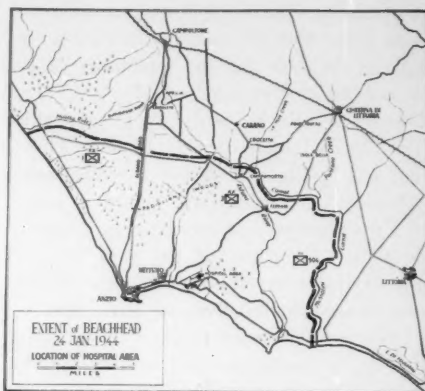


FIG. 7

and identified by the Geneva Convention markings.

The 56th Evacuation Hospital, commanded by Colonel Henry S. Blesse, Medical Corps, arrived as scheduled on D plus 6 after experiencing great difficulty caused by storms at sea. The convoy also brought to the beachhead the nurses of the hospitals and surgical teams that had arrived with the D day troops. Upon arrival on the beachhead the 56th Evacuation hospital moved to the newly selected site and established the first hospital in that area. This hospital opened on 30 January and on that date the 93rd and 95th Evacuation hospitals were closed, their patients either evacuated to hospital carriers or transferred to the 56th Evacuation hospital. The 93rd and 95th Evacuation hospitals were then moved to the "hospital area" with the 93rd occupying a site east of the 56th and the 95th the area northwest of the 56th. This hospital area was soon dubbed "hell's half acre" by both patients and personnel for reasons which soon became obvious. The Sanatorium housing the 2nd CCS also had been shelled and the unit was moved to a new location about two miles north of Anzio in an open area east of the Anzio-Albano-Rome road.

10

VI Corps consolidated its positions during the period 24-29 January while awaiting re-

inforcements. The 179th Regimental Combat Team of the 45th Division reached the beach-head on the 24th and the remainder of the division under command of Major General William W. Eagles arrived on succeeding days. On 28 January, the 1st Armored Division, less Combat Command B, commanded by Major General Ernest N. Harmon joined VI Corps troops and immediately prepared for action. Elements of the 45th Division upon arrival were deployed along the Moletta river to hold the left flank of the Corps.

Designed to coincide with a renewed offensive on the southern front of Fifth Army, Major General John P. Lucas, VI Corps Commander, planned a two-pronged assault in the direction of Coli Laziali. This action was to secure more favorable defensive positions and to deny this terrain which was beneficial for the Germans to launch their attack. The VI Corps plan called for the 1st British Division, supported by the 1st Armored Division, to drive up the Anzio-Albano road and capture the high ground about Carroceto; while the 3rd Division with the Ranger Force attached was to seize Cisterna and cut Highway No. 7. The main blow was to be delivered on the left.

The drive on Cisterna by the 3rd Division under Major General Lucian K. Truscott, Jr., was preceded by a spear-head attack by Colonel William O. Darby's Rangers, veterans of North Africa, Sicily and Salerno. The Rangers were to jump off an hour before the main attack of the division and infiltrate under cover of darkness four miles across the fields to seize Cisterna by surprise and hold it until the main attack came up.

Men of the 1st and 3rd Rangers slipped across the west branch of the Mussolini canal at 0130 hours, 30 January, and in column of battalions crept silently forward along the narrow Pantano ditch. By dawn the head of the leading battalion was within 800 yards of Cisterna. With the coming of first light the column was revealed and a strong German force suddenly opened fire. The Rangers had run into a German ambush and were trapped in a hail of fire. Caught without cover in the open fields the Rangers engaged

with a hidden enemy and fought desperately all through the morning. The 4th Rangers and 3rd Battalion, 15th Infantry, who had jumped off an hour after the 1st and 3rd Rangers, made every effort and fought valiantly to reach their beleaguered comrades but were stopped by heavy machine gun fire. All day the Germans held the 4th Rangers who suffered heavy casualties from the enemy only 200 yards away.

Along the road below Cisterna the 1st and 3rd Rangers were almost of the end of their strength. At noon enemy tanks came down Highway No. 7 and raced back and forth through the Ranger positions forcing the Rangers into the open and splitting them into small groups. Without anti-tank guns the Rangers fought back with every weapon they had. As the tanks closed in the shattered companies attempted to withdraw, but it was too late. Of 767 men in the Ranger attack only six escaped. Most were captured by the Germans. Included in the group were 21 members of the 52nd Medical Battalion who had accompanied the Rangers as litter-bearers.

The 7th Infantry formed the left prong of the 3rd Division attack and had as its mission the cutting of Highway No. 7 above Cisterna. After a long night march to its line of departure the 1st Battalion launched its attack at 0200 north along Le Mole creek in an effort to cut the highway before daylight. The 2nd Battalion's assault up the Crocetta-Cisterna road did not get started until 1115 hours.

On the extreme left of the division the 30th Infantry had succeeded in forcing the enemy to withdraw in the vicinity of the road junction below Ponte Rotto. On the day before the VI Corps attack the 30th Infantry was still fighting for the area designated as the line of departure for the 1st Battalion of the 7th Infantry. The advance of the 7th Infantry was greatly hampered in their night movement by 20-foot deep drainage ditches overgrown with briars. After pressing forward a mile and a half a sudden burst of German flares starkly outlined the troops against the dark ground.

All around them the enemy opened fire and daylight revealed the 1st Battalion caught in a small pocket surrounded by small knolls from which the enemy poured down murderous automatic fire. The men sought the cover of the ditches, but were enfiladed by German machine guns. The battalion suffered heavy losses.

The attack of the 3rd Division gained half the distance to Cisterna in this first day's action. For the next two days the division continued its assault, renewing its effort to reach Cisterna on the morning of 1 February. Jumping off at first light, the 1st Battalion, 30th Infantry, fought its way 1,000 yards farther up the Ponte Rotto-Cisterna road. Reaching the Pantano ditch, less than a mile west of Cisterna, the battalion was halted by a well-laid artillery concentration. A German infantry battalion, reinforced by tanks and artillery, counter-attacked before the American troops could organize for defense. This dangerous assault was staved off largely by the heroic action of Private First Class Alton W. Knappenberger, Company C, 30th Infantry. This fearless defender of the beachhead was awarded the Medal of Honor (Sect. II, General Orders No. 41, War Department, 26 May 1944) and his citation describes his heroism:

"Private First Class Alton W. Knappenberger (Army serial No. 33 618 556), Company C, 30th Infantry, United States Army. For conspicuous gallantry and intrepidity at the risk of life above and beyond the call of duty in action involving actual conflict with the enemy, on 1 February 1944, near Cisterna di Littoria, Italy. When a heavy German counterattack was launched against his battalion, Private Knappenberger crawled to an exposed knoll and went into position with his automatic rifle. An enemy machine gun 85 yards away opened fire and bullets struck within 6 inches of him. Rising to a kneeling position Private Knappenberger opened fire on the hostile crew, knocked out the gun, killed two members of the crew, and wounded the third. While he fired at this hostile position, two Germans crawled to a point within 20 yards of the knoll and threw potato masher grenades at him, but Private Knappenberger killed them both with one burst from his automatic rifle. Later a second machine gun opened fire upon his exposed position from a distance of 100 yards, and this weapon was also

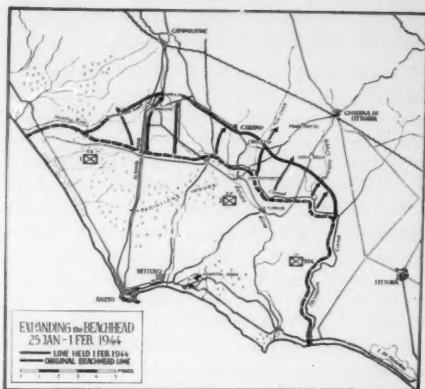


Fig. 8

silenced by his well-aimed shots. Shortly thereafter, an enemy 20-mm anti-aircraft gun directed fire at him, and again Private Knappenberger returned fire to wound one member of the hostile crew. Under tank and artillery fire, with shells bursting within 15 yards of him, he held his precarious position and fired at all enemy infantrymen armed with machine pistols and machine guns which he could locate. When his ammunition supply became exhausted, he crawled 15 yards forward through steady machine gun fire, removed clips from the belt of a casualty, returned to his position, and resumed firing to repel an assaulting German platoon armed with automatic weapons. Finally, his ammunition supply being completely exhausted, he rejoined his company. Private Knappenberger's intrepid action disrupted the enemy attack for over two hours."

The heroism displayed by the men of the Ranger Force and of their comrades of the 3rd Division, who sought desperately to rescue them, was not confined to the soldiers of the combat arms. Medical aid men and litter-bearers who accompanied the combat troops into battle exhibited great courage in this aborted attack on Cisterna. Among these medical soldiers was Private First Class Lloyd C. Hawks, Medical Detachment, 30th Infantry, who in the performance of his duty to aid the wounded, so distinguished himself that he was presented the Nation's highest award for heroism in the face of personal danger—the Medal of Honor—by a grateful country. The citation for this award as published in War Department

General Orders No. 5, 15 January 1945 reads as follows:

"Private First Class Lloyd C. Hawks (Army serial No. 37 019 945), Medical Detachment, 30th Infantry, United States Army. For gallantry and intrepidity at the risk of his life above and beyond the call of duty. On 30 January 1944 at 1500 hours near Carano, Italy, Private Hawks braved an enemy counterattack in order to rescue two wounded men who, unable to move, were lying in an exposed position within 30 yards of the enemy. Two riflemen attempting the rescue had been forced to return to their fighting holes by extremely severe enemy machine gun fire, after crawling only 10 yards toward the casualties. An aid man, whom the enemy could plainly identify as such, had been critically wounded in a similar attempt. Private Hawks nevertheless crawled 50 yards through a veritable hail of machine gun bullets and flying mortar fragments to a small ditch, administered first aid to his fellow aid man who had sought cover therein, and continued toward the two wounded men 50 yards distant. An enemy machine gun bullet penetrated his helmet, knocked it from his head, and momentarily stunned him. Thirteen bullets passed through his helmet as it lay on the ground within 6 inches of his body. Private Hawks crawled to the casualties, administered first aid to the more seriously wounded man, and dragged him to a covered position 25 yards distant. Despite continuous automatic fire from positions only 30 yards away and shells which exploded within 25 yards, Private Hawks returned to the second man and administered first aid to him. As he raised himself to obtain bandages from his medical kit his right hip was shattered by a burst of machine gun fire and a second burst splintered his left forearm. Displaying dogged determination and extreme self-control despite severe pain and his dangling left arm, Private Hawks completed the task of bandaging the remaining casualty and with super-human effort dragged him to the same depression to which he brought the first man. Finding insufficient cover for three men at this point, Private Hawks crawled 75 yards in an effort to regain his company, reaching the ditch in which his fellow aid man was lying."

By noon of 1 February it was clear that the 3rd Division, holding a wide front and exhausted by three days of bitter fighting, could not hope to take the key town of Cisterna in the face of the ever increasing build-up of enemy troops. General Truscott pulled back the 1st Battalion, 30th Infantry, from its exposed position to the stream line

at Ponte Rotto and ordered all troops to dig in immediately to meet the expected attack.

While General Truscott on the right drove on Cisterna the 1st British Division under Major General W. R. C. Penney attempted to break the enemy's main line of resistance at Campoleone. Sharp fighting for the line of departure delayed the attack until after 1500 hours, 30 January. The 1st Armored Division swung left of the Albano road to assault Colli Laziali from the west. The attack of the armored division was hampered by a series of deep, rough stream gullies. Tanks and armored cars, unable to cross the deep ravines of the Moletta river were halted by mine fields and intense enemy fire and as soon as they stopped became bogged down in the mud.

The plan of attack by the 1st British division was changed in order to obtain more effective support by the armored force but stiff enemy resistance along the railroad embankment at Campoleone held up the assault.

The Allied attack toward Campoleone had made better progress than that of the 3rd Division's drive on Cisterna. It reached Campoleone and penetrated the German line of resistance creating the Campoleone salient; but the VI Corps had spent its forces and it was evident that the main German line actually passed through Cisterna and Campoleone and did not lay back on the high ground of Colli Laziali and the Lepini mountains.

The initial beachhead was the largest area that could be held by the available troops and it was so small that any part of it could be reached by enemy artillery. There was not sufficient room for maneuver or defense. Although it was essential to enlarge the beachhead farther inland it was evident that this objective could not be immediately obtained. On 2nd February, General Clark radioed General Lucas to prepare for defense. The following day all units of VI Corps assumed the defensive and made preparations to meet the expected German attack.

Allied reinforcements were sped to the beachhead. The 1st Special Service Force, a mixed brigade of picked Canadians and Americans, who had already distinguished themselves on Kiska in the Aleutians and the mountains of Italy, arrived on 2 February under the command of Brigadier General Robert T. Frederick. The next day brought the 168 Brigade of the 56 British Division to aid the British. Anti-aircraft and heavy artillery were greatly strengthened. By 4 February, VI Corps troops had increased to nearly 100,000 including service elements. Although still inferior to the enemy in number of troops, the Corps was better equipped and supplied than the opposing German forces.

The projected main Fifth Army drive against Cassino and the strongly defended mountain pass to its rear was launched on the first of February. During the first week of February the troops of the U. S. II Corps penetrated the mountain defenses of the Gustav line and fought into Cassino itself; but they could not break the final German positions and reach the Liri valley. For the rest of the month there was little progress made and a stalemate developed. Thus by holding the Fifth and Eighth armies at bay on the south the Germans were in a favorable position to prepare for an all-out drive against the beachhead and drive the forces of VI Corps back into the sea. The situation on Anzio beachhead became critical.

(To Be Continued)



EDITORIALS

Poliomyelitis

FOR the past year we have been following closely the *Morbidity and Mortality Weekly Report* of the Public Health Service, U. S. Department of Health, Education, and Welfare, with particular interest in the poliomyelitis statistics. The reduction in the rate of this dreaded disease is gratifying. For the 50-week period of 1957 there were 5,833 cases of poliomyelitis reported in the United States, 2,125 of which were the paralytic type. For the same period of 1956 there were 15,226 cases reported, of which 6,616 were paralytic.

During the summer months we become panicky when we hear of an outbreak of poliomyelitis. We want to close swimming pools and theaters, cancel vacation trips, and take other measures to avoid this disabling disease. There is something we can do right now.

Vaccination against poliomyelitis can be done and should be done during the winter months. It takes time to build up immunity. That immunity can be built up now before the polio season comes upon us again. Why not make a concerted campaign to get every one under forty years of age vaccinated? There is plenty of vaccine available. Three injections of the vaccine are recommended: two injections with an interval of two to six weeks between the first and second, and a third injection of the vaccine from seven months to one year after the second injection. **VACCINATE AGAINST POLIO NOW.**

Then there is another thing that can be done by us for those who have been so unfortunate as to have experienced the crippling effects of this disease. **JOIN THE MARCH OF DIMES.** There is much yet to be done in the way of treatment and re-

habilitation for those persons. This takes money.

In addition to the care of the patient there is needed continued research to understand more about the disease and to develop some specific drugs. We have not learned all we must know about poliomyelitis.

So let us fight the disease with vaccination and dimes. Now is the time.

Salesman vs. Professor

BEFORE a committee of Senators investigating the causes of our recent setback in the world race for championship in science, and searching for the foundations which have helped the Russians in the successful launching of their satellite toys, "Sputnik I and II," Dr. Teller, the inventor of our hydrogen bomb and a Hungarian immigrant professor of physics at a California university, appeared as one of the testifying witnesses.

In explaining his own analysis of the problems to the delight of his senatorial audience, the professor remarked that in his opinion one of the basic factors of the relative stagnation of scientific progress in this country was the scholar's and scientist's universal dethronement by the American populace from the pedestal of appreciation which he is entitled to have as a natural reward for the sacrifice of his youth and for the devotion to his studies. As an example of the perverted attitude, Dr. Teller ironically singled out the popular football hero whom the crowd is more willing to accept and follow as a leader and whose achievements the American youngster finds more worthy and more profitable to emulate than the thorny life of the man of science.

The seriousness of this universal devaluation of science, scholarship and pure crea-

tive effort in America has been demonstrated in many ways in our times. We may find examples of this devaluation in the general shift of leadership values and virtues from the outstanding and rare to the average, in the encroachment of administrative mediocrity upon the field of technical management, in the abandonment of the hard ways of mental training in favor of playful distortions of the mind of the youth by faddists in educational psychology and pedagogics, etc.

We may also find examples in the everyday life. About a decade ago, a friendly professor of political geography (or geopolitics), another Hungarian, was driving back in his old Ford car from Baltimore to Washington. On his way home, along Highway No. 1, he picked up a well-dressed man who happened to thumb his way back to the capital. They started a lively conversation. The professor had been talking so convincingly on a great variety of topics and he was so full of accurate details of information that his thumb-riding passenger was truly astonished.

"What is your occupation, Sir?" he asked his host wonderingly.

"I am professor at Georgetown University" answered the geopolitician.

"Oh!" replied the rider with pity in his voice, "I thought that you must be at least a salesman."

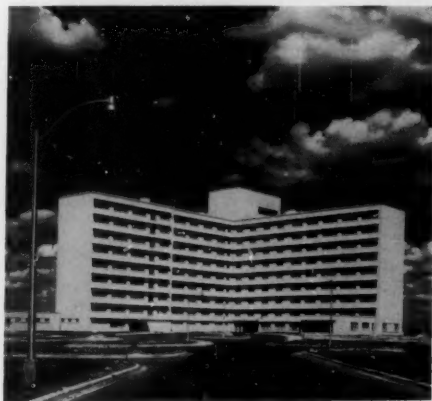
It would be futile to expect that, in a society predominantly built upon business and chiefly led by businessmen, the attitude of the average man could change in less than a generation from the glorification of the football hero and of the salesman to an admiration of the professor.

Our age of progress demands leaders who, by their education and special knowledge, are able to recognize the values of the products of science as well as the opportunities for their applications. The Era of Heroes must include not only the football, baseball, and TV stars but also the teachers, the researchers, the lowly student. Spectacular things are happening in science and other fields. Let's turn the spotlight of recognition in that direction for awhile.



NEW U. S. AIR FORCE HOSPITAL

The 3700th U. S. Air Force Hospital, Lackland Air Force Base, San Antonio, Texas, was formally dedicated on November 16, 1957. Major General Dan C. Ogle, Surgeon General of the Air Force presented the major address. This 500-bed hospital with expansion facilities for 1000 beds is the first Air Force hospital with a teaching program for interns and residents. There will also be a curriculum in hospital administration. Colonel John E. Pleunke is the commanding officer.



U. S. Air Force Photo

Around the World

(Ser. II, No. 17)

By

CLAUDIUS F. MAYER, M.D.

QATAR is one of the small Arab States of the Persian Gulf, a peninsular area, about 100 miles by 30 miles in extent, with a population of ca. 30,000. It is a sheikdom which became rich from the oil concessions granted to a British company. Great Britain concluded its first agreement with the *Sheikh of Qatar* in 1868, and another Treaty in 1916. The Sheikh agreed to the suppression of slave trading, of piracy, and the preservation of maritime peace, while the British Government undertook to protect the State from aggression by sea and land. Oil was first produced at the end of 1949, and in 1955 the production amounted to 5.4 million long tons. The oil revenues are used for many good projects, including a sea-water distillation plant, with a capacity of 60,000 gallons a day.

The Sheikh, who considers himself the father of his people, is using his new wealth in the right way. At Doha, in the capital of the sheikdom, he just opened a *luxurious 130-bed hospital*, with 5 operating theaters, equipped with the most modern fittings and instruments. Further evidences of the sheikh's paternal care are seen in the almost 100% vaccination of the people, the BCG vaccination of all children, the program of tuberculosis survey by small film radiography. Tuberculous patients are now sent to a sanatorium in Lebanon. Foreign nationals with tuberculosis are sent home without expense to themselves. The staff of the new hospital is now being recruited.

During the years of World War II, the French Government established a huge *plantation of cinchona trees at Sérédou* in French West Africa, with a smaller branch at Man (Ivory Coast). The plantation includes a 320 hectar area at the main *experimental center*. The cinchona trees are planted

at the rate of 10,000 trees to a hectar. The center has laboratories to manufacture quinine and its salts. The establishment also experiments with the cultivation of tea, abrasin, coffee, cacao, and medicinal plants.

At the last meeting of the *North Queensland Medical Conference*, a doctor of Cairns discussed the *injuries caused by marine animals*. A registry of such cases has been kept in Cairns since 1934. The danger from sharks is probably overestimated; fatalities are usually due to a shark which had acquired a taste for human flesh. Otherwise, swimming in "shark-infested" waters is perhaps less risky, the doctor says, than driving a car across a city. The popular fear of stonefish is not justified, at least the Australian species has never caused a fatality. Stories of people whose foot was caught by the giant clam (*Tridacna*) are pure fiction; the valve-like clams close slowly when disturbed, and they cannot close tightly because the mantle is too thick. The giant groper may be more dangerous to divers than the sharks, though no injuries have ever been reported. The Portuguese man-o'-war (*Physalia*) is blamed for many injuries produced by other organisms. Its stings are seldom fatal. The so-called sea-wasp (*irakundji*) is microscopical, and causes small puncture-like stings which are followed by muscle-cramps, retching, and vomiting.

The *Yuendumu native settlement*, in Western Australia, is reserved for the aboriginal Ngalia tribe. An obstetrician of the University of Adelaide recently had an opportunity to observe the child-birth customs of these people. Most deliveries are normal confinements under the conduct of the tribe's own midwives, performed at a place away from the main camp. If there is any trouble, an airplane ambulance will take the patient to the nearest hospital. In a normal delivery,

the wife assumes a squatting position. A midwife or her assistant applies force over the abdomen during uterine contractions, and rubs warm ashes on the abdomen. The baby is expelled unaided onto the red earth. The cord is severed by being jabbed with a yam stick 10 inches from the navel. The exposed end is dressed with mud. The placenta is delivered by foot pressure over the fundus of the uterus while the mother is still in the squatting position. A hole is then dug and the placenta is burnt and buried. The baby is smeared with charcoal to make him "a proper black fellow." The mother is fumigated in the following days while reclining over the fumigating ditch containing a smouldering fire, covered with ashes and dirt. Lochia is said to be considerably less than in white women. Eight days after delivery the mother is up and about.

A meeting was held in the fishing village of *Pugwash, Nova Scotia*, at which the assembly of scientists discussed the *possible hazards* which would face humanity should *another world war* break out. The meeting was from 6 to 11 July, 1957; the main work of the meeting was centered around the topics, (1) hazards arising from the use of atomic energy in peace and war, (2) problems of control of nuclear weapons, and (3) social responsibility of the scientists. The meeting suggested that, without abandoning loyalty to national heritage or to fundamental principles of the different societies, education of all youth should emphasize peace and cooperation rather than the glorification of war.

Members of the *French Academy of Medicine* made a resolution against the present wholesale roentgen photographic method for the *detection of tuberculosis* in groups of people. Tuberculosis detection should be based chiefly upon the use of the various tuberculin allergy tests (cuti-reaction, intradermo-reaction, patch test). Only those who show a positive reaction to tuberculin should be further examined by radiography. X-ray examination as a diagnostic procedure

should be discontinued as much as possible. The recommendation of the Academy has been transmitted to the French ministries of Education and of Public Health.

Lourdes will be one hundred years old this year. It is well known that alleged "cures" are relatively infrequent and that any claim of a miraculous or supernatural nature is scrutinized with the greatest care by the Catholic officials whose function is the critical examination of unusual cures. The official *Lourdes Medical Bureau* accepted only 98 "cures" in the period from 1925 to 1950, and only 10% of these were considered as genuine instances of remarkable cures, in other words "*miracles*." In these cases the most remarkable feature of the cure was the speed and manner in which the recovery occurred, according to a medical visitor whose investigation was made at the instigation of the Parapsychology Foundation of New York.

Milk distribution was suspended from farms in the neighborhood of the *Wind-scale Atomic Energy Plant* in Cumberland, England. Uranium cartridges overheated in a resting reactor, and *radioactive iodine escaped* into the atmosphere and settled upon the surface of the fields grazed by cows. The affected area was 200 square miles. Milk samples taken a few days later contained six times the concentration of the isotope permissible for a lifetime's milk drinking. A similar large scale accident once occurred at Chalk River, Canada. Of course, in radiodiagnostics for thyroid disease we give 1000 times, even 5000 times larger doses of radioiodine than the one consumed by drinking milk from cows contaminated in this area. Someone calculated that to have one ounce of radioiodine taken by such food, one should drink 800 million pints of the milk.

In Hornchurch, England, a *75-year old woman died in child-labor* according to the village doctor (Dr. James Gornan). London gynecologists also confirmed the case. This seems to be the third recorded case in history where a pregnant woman was so old. The

other previous cases occurred in 1866 (a 65 year old woman in Spain) and in 1766 (a 72 year old woman), if they could be accepted as authentic.

All over the world his friends were sorry to hear that, after his retirement from the editorial chair of the Medical Journal of Australia, Dr. Mervyn Archdall suddenly died on 6 September 1957 on his 73rd birthday. Rudolph Matas, surgeon at New Orleans and pioneer in vascular surgery also died in September. He was 97 years of age. Another international loss is the recent death of Ferdinand Morel (1888-1957), Swiss psychiatrist, author of many essays and studies.

Some time ago we reported that the I. G. Farbenindustrie wished to compensate the victims of the Auschwitz labor camp. An *International Auschwitz Committee*, however, which had been organized from the victims of Nazism from 32 countries, believes that 30 million Reichsmarks is inadequate as a compensation. The I. G. Farbenindustrie agreement ignored the victims in such countries as Poland and Hungary, and made no provision for the orphans and widows of the workers executed by SS men on the instructions of the I. G. Farbenindustrie. The same committee also wishes to construct a monument at the site of the Auschwitz camp.

This reminds us that the former head of the *experimental block in the Auschwitz concentration camp*, a certain Prof. Klauberg, who is now 58 years old, will soon be tried as a war criminal. This German gynecologist was under the order of Himmler to study new methods of depopulation. He carried out cruel experiments on women half of whom died in the sterilization process. This doctor was in a Russian prison from which he returned in November 1955 when he was arrested by German authorities.

A recently published, well-documented German work, written by H. C. Adler, described the infamous *Theresienstadt* (Terezin) experiment, the "model ghetto" which Hitler established in the evacuated fortress

town of Northern Bohemia. It was the concentration camp where from 1941 on until the arrival of Allied troops in May 1945, 141,000 "non-Aryans" (Jews) passed through from 17 countries. Only 10,500 were present at the time of their liberation; others either died "naturally" from slow starvation, overwork, and despair, or were exterminated at Auschwitz, Maidanek, Treblinka, and elsewhere.

Theresienstadt was a *normal Jewish town*, the show window of Himmler who wanted to prove to the world that nothing is happening to the Jews in Hitler's Germany. The inhabitants had their autonomy, legal code, and even currency, and were doing all sorts of productive work. Even the inspectors of the Red Cross were fooled by this "Paradise Ghetto" which the camp's commander could streamline in a few weeks before the Red Cross visit. The head of "self government" was Dr. Paul Epstein who was promoted to "mayor" for the occasion of the visit. It is interesting to know that many of the *Jewish officials* of this town turned into *Nazi stooges* who indulged in "luxuries," and their corruption slowly percolated downwards. The author of this work and his wife and his mother-in-law were inmates of the town from where they were sent to Auschwitz for extermination in December 1944. Only the author escaped.

Communists easily take the poor, non-suspecting doctor and make him join any *front organization* in which, behind a highly respectable title, they can be made members of the faceless mass. Some of these organizations are the following: (1) Medical Association for the Prevention of War (since 1951), in England; (2) Union national des médecins pour la Paix, in France; (3) Doctors' Anti-War League, in Denmark; (4) World Congress of Doctors for the Study of Contemporary Living Conditions, which was founded by the World Peace Council, also a Communist organization.

In the *Soviet Union*, *military preparedness* is concentrated upon the preparation of Russian youth from 11 to 16 years of age.

The young people are in physical training under the control of various official organizations, and they have to reach a basic standard of preparedness of the national manpower. This standard includes knowledge of poisons, *first aid* in poisoning, wounds and shock. The youngsters are trained in running, swimming in clothes and with weapons, passing under fire from small-caliber weapons, parachuting, and skiing. Students of higher educational establishments go through a higher paramilitary training. Thus, now a minimum of 25% of Russia's population is occupied in this physical training; it represents a reserve force of over 50 million people.

The head of the First Moskva Medical Institute's Chair of Public Health (Jakov Rodov) informs us that, according to Article 120 of the Constitution of the Soviet Union, the entire *population of Russia is entitled to free medical service*. In 1955, out-patient treatment was given on 804,295,500 occasions, the total population of Russia being 200,200,000 (his figure). In the same year, doctors' assistants in the country received patients on 150,000,000 occasions. The number of doctors in Russia reached 310,186 in 1956, and the number of medical institutions is stated as 150,000. The over-all mortality dropped, and the average *life span of a Russian* now is claimed to be 64 years (it was 32 years in 1913).

At the 14th Congress of the *USSR Therapeutic Society*, held in Moskva in October 1956, the main topics of discussion were atherosclerosis, disturbances in the coronary circulation of the heart, infarction, and the treatment of *cardiovascular diseases* at spas and sanatoriums. Soviet pathologists (Anichkov, Mjasnikov) hold the view that atherosclerosis starts with a breakdown in the endocrine control of metabolism, resulting in lipid infiltration of the arterial wall. Hypertension would be a predisposing factor. The pathogenesis of both anginal pain and infarction starts with the effect of the two factors: arterial disease and neuroreflex

mechanism. Soviet doctors assert that acute coronary insufficiency is caused by neuro-functional factors alone at least in 25% of the hypertensive patients.

"*Agrotown*" is a new form of rural development which the Soviet Union initiated in 1954. The first experiments in this project are carried out in the *newly reclaimed areas of Kazakhstan*. Agrotown is formed by gathering 3-4 sovkhoses into a central settlement as a township. In the vast, unpopulated areas such group settlements have many advantages over the old-fashioned system of isolated sovkhoses. A number of standard types of agrotown have been designed by government planning organizations. The agrotown is composed of domestic housing units, administrative and cultural buildings, and an industrial sector. About 800 people can be accommodated in one agrotown unit. The unit is located near an ample water supply, and its population is *served by a dispensary and a small hospital* close to which is also the public bath. Some people with families will have individual detached houses, with gardens, while others will live in hostels and apartments. The area of an agrotown is ca. 75 hectares. If the first agrotowns on the Kazakhstan steppes will be successful, similar settlements will be erected at other parts of the U.S.S.R.

The British clothing industry was interested in the *measures of the average English woman*. Hence, a large sample of femininity was taken so that by the collected data better fitting clothes could be manufactured. About 200,000 measurements were made on 5,000 women whose ages ranged from 18 to 70. The average woman who emerges from these measures bears a striking resemblance to the women painted by Renoir, which is a high *compliment for British beauty*. By the way! The clothiers also showed that the topheavy film star, with large busts and small hips, is more or less a freak. By comparison, the average American woman is heavier, longer in body and shorter in legs, and much smaller in the bust. . . . *Multa paucis!*

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Announcement

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The 65th Annual Convention of the Association of Military Surgeons of the United States will be held at the Hotel Statler, Washington, D.C., November 17, 18 and 19, 1958.

INFORMATION FOR AUTHORS

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ADDRESS: Send manuscripts to the Editor, *MILITARY MEDICINE*, Suite 718, 1726 Eye Street, N.W., Washington 6, D.C.

The Sir Henry Wellcome Medal and Prize

COMPETITION FOR 1958

THE competition is open to all medical department officers, former such officers, of the Army, Navy, Air Force, Public Health Service, Veterans Administration, The National Guard and the Reserves of the United States, commissioned officers of foreign military services, and all members of the Association, except that no person shall be eligible for a second award of this medal and prize and no paper previously published will be accepted.

The award for 1958, a medal, a scroll, and a cash prize of \$500, will be given for the paper selected by a committee composed of the Association's vice-presidents which reports on the most useful original investigation in the field of military medicine. The widest latitude is given this competition, so that it may be open to all components of the membership of the Association. Appropriate subjects may be found in the theory and practice of medicine, dentistry, veterinary medicine, nursing and sanitation. The material presented may be the result of laboratory work or of field experience. Certain weight will be given to the amount and quality of the original work involved, but relative value to military medicine as a whole will be the determining factor.

Each competitor must furnish six copies of his paper which must not be signed with the true name of the author, but are to be identified by a *nom de plume* or distinctive device. These must be forwarded to the Secretary of the Association of Military Surgeons of the United States, Suite 718, 1726 Eye St. N.W., Washington 6, D.C., so as to arrive at a date not later than 1 July 1958, and must be accompanied by a sealed envelope marked on the outside with the fictitious name or device assumed by the writer and enclosing his true name, title and address. The length of the essays is fixed between a maximum of 10,000 words and a minimum of 3000 words. After the winning paper has been selected the envelope accompanying the winning essay or report will be opened by the Secretary of the Association and the name of the successful contestant announced by him. The winning essay or report becomes the property of the Association, and will be published in *MILITARY MEDICINE*. Should the Board of Award see fit to designate any paper for "first honorable mention" the Executive Council may award the writer life membership in The Association of Military Surgeons, and his essay will then also become the property of the Association.

ASSOCIATION NOTES

Timely items of general interest are accepted for these columns. Deadline is 3rd of month preceding month of issue.

Department of Defense

Ass't Secretary (Health & Medical)—HON.

FRANK B. BERRY, M.D.

Deputy Ass't Sec'y—HON. EDW. H. CUSHING, M.D.

CIVILIAN MEDICAL CONSULTANTS

At a recent meeting of the Civilian Medical Consultants to the Armed Forces which was held in Washington, D.C., Dr. George O. Eaton, a Baltimore (Md.) orthopedic surgeon, was elected president. Other officers were: Dr. Bruce Webster, New York City, vice-president and president-elect; Dr. William A. Howard, Washington, D.C., secretary; and Dr. Theodore J. Abernathy, Washington, D.C., treasurer.

SELECTIVE SERVICE

The Department of Defense has requested Selective Service to furnish 10,000 men for the Army during the month of January.

Army

Surgeon General—MAJ. GEN. SILAS B. HAYS

Deputy Surg. Gen.—MAJ. GEN. JAMES P. COONEY

PROMOTED

Major General John F. Bohlender, Commanding Officer of Tripler Army Hospital, Hawaii, recently received his second star.

QUICK X-RAYS

A new x-ray film processing unit was recently installed in the Radiology Clinic at Walter Reed Army Hospital. It is now possible for an x-ray film to be exposed, processed, and put into the hands of the doctor in less than ten minutes. The film furnished the doctor is a dry film. Before the installation of this unit it was, of course, possible to furnish a wet film for reading in case of an emergency but this as is known had its disadvantages.

APPOINTED LECTURER

Colonel George W. Hunter, III, USA, Retired, formerly an officer in the Medical Service Corps of the Army, has been appointed Lecturer in Biological Science and Medicine at the new Medical School, University of Florida. He teaches Medical Parasitology. His present address is: Department of Microbiology, College of Medicine, University of Florida, Gainesville, Fla.

ADDRESSES MSC OFFICERS

Major General Alvin Gorby, Surgeon, U. S. Army Europe, at a recent meeting of the Medical Service Corps Officers assigned to the vicinity of the Landstuhl Army Medical Center, Landstuhl, Germany, emphasized the importance of the Corps and pointed out ways in which the officers could assist in field duties of the Medical Service.

General Gorby stated that the Medical Service Corps was formed on May 18, 1917 and was expanded during World War II to a strength of 20,500. At the present time there are 4,000 officers of the Corps on active duty in the Army.

Navy

Surgeon General—REAR ADM. BARTHOLOMEW W. HOGAN

Deputy Surgeon General—REAR ADMIRAL
BRUCE E. BRADLEY

NURSE TO CAPTAIN RANK



Official Photo U. S. Navy

CAPT. E. C. KENNEY, MC, USN, Commanding Officer, U. S. Naval Hosp., NNMC, Bethesda, Md., presents appointment to CAPT. RUTH A. HOUGHTON, NC, USN.

The honor of being the first U. S. Navy nurse to be selected to the rank of Captain under Public Law 85-155 which was signed by President Eisenhower on August 21, 1957, goes to Captain Ruth A. Houghton who is stationed at the National Naval Medical Center, Bethesda, Maryland. She is Chief, Nursing Service, at the Center.

Captain Houghton is a graduate of the School of Nursing, St. John's Hospital, Lowell, Mass., and gives her permanent address as Andover, Mass. She started her naval career in June 1935.

Air Force

Surgeon General—MAJ. GEN. DAN C. OGLE
Deputy Surg. Gen.—MAJ. GEN. OLIN F.
MCILNAY

NEW CHIEF MSC

Colonel Leonard P. Zagelow, USAF (MSC), assumed his duties as the new Chief of the Medical Service Corps, U. S. Air Force on December 1, 1957. He succeeded Colonel Phillip G. Fleetwood, the



U. S. Air Force Photo

COL. LEONARD P. ZAGELOW, USAF (MSC)

first chief of the Corps, who retired and will make his home at Cedar Hill Farm, Roseville, Virginia.

Colonel Zagelow is a native of Odessa, Washington. In 1937 he received his Bachelor of Science and Pharmaceutical Chemist degree from Washington State College, and in 1951 he was awarded his Master of Science degree in Pharmaceutical chemistry and Pharmacology by the University of Minnesota.

He entered the Army as an Infantry officer on July 15, 1937, and transferred to the Medical Service in February 1938. On July 25, 1950 he transferred to the Air Force Medical Service.

For three years he was Assistant Professor of Military Science and Tactics at the University of Minnesota. As Chief of the Air Force Medical Requirements and Stock Control Office in New York City, Colonel Zagelow was involved in the computation of medical materiel requirements for the United States Air Force and distribution of medical supplies in continental United States depots. As the Air Force member of the Armed Services Medical Materiel Standardization Committee he rep-

resented the Air Force in the standardization and cataloging of medical supplies, and in January 1956 he was assigned to the Office of the Surgeon General of the Air Force of the Materiel Division, Directorate of Plans and Hospitalization.

SPACE FLIGHT SYMPOSIUM

The Second Symposium on the Physics and Medicine of the Upper Atmosphere and Space will be held at the School of Aviation Medicine, Randolph Air Force Base, Texas, November 10-14, 1958. Prominent speakers will be on the program of this very important symposium.

Public Health Service

Surgeon General—LEROY E. BURNEY, M.D.
Deputy Surg. Gen.—JOHN D. PORTERFIELD, M.D.

STROKES

The Public Health Service estimates that 172,000 lives are taken annually in this country by strokes and cerebral vascular diseases. In fact these rank after heart disease and cancer as killers.

The effectiveness of anticoagulant drugs in preventing strokes will be studied in the next three years, the study to be made under the auspices of the National Institute of Neurological Diseases and Blindness. The program called for grants totaling about \$58,000 which will be distributed to six medical research centers. Prevention will be emphasized in this study rather than treatment.

ANTICANCER COMPOUNDS

Chemicals such as antimetabolites and synthetic hormones will be produced for the National Cancer Institute in its research studies in cancer. The chemicals to be synthesized by six research organizations will be tested against three types of animal tumors.

The National Cancer Institute is located at the National Institutes of Health at Bethesda, Maryland.

CHEST X-RAYS

The mass x-ray surveys for tuberculosis that have been made for a number of years have recently come in for comment by the Public Health Service. That service feels that there should be selection for the chest x-rays rather than the wholesale method that has been used.

Surveys by x-ray should be used in the high risk groups, such as the low income groups, migrant workers, and known exposures to tuberculosis. In the low risk groups the tuberculin skin testing should be used as a first step with the x-ray of the chest limited to the positive reactors.

In this connection readers are referred to the article, *Tuberculosis: Yet and Unconquered Disease* by Colonel Eugene C. Jacobs, MC, U. S. Army, which appeared in the January issue of *Military Medicine* (Vol. 120, page 1, 1957).

INTERNATIONAL CERTIFICATES OF VACCINATION

The revised International Certificate of Vaccination (January 1957) is the only form that should be used. The Public Health Service has requested that all old certificates be destroyed.

CHIEF, PSYCHIATRIC PROGRAM

Dr. Dominick J. Lacovara, Senior Surgeon, has been promoted to chief Medical Officer and Chief, Psychiatric Program at the Federal Correctional Institution, Ashland, Kentucky. The institution handles the Federal juvenile cases (ages 17-21) east of the Mississippi.

LEXINGTON HOSPITAL CHIEF

Dr. Murray A. Diamond was recently assigned as Medical Officer in Charge of the Public Health Service Hospital at Lexington, Ky. This hospital is one of the world's largest institutions for the study and treatment of narcotic addiction.

Dr. Diamond succeeds Dr. James V. Lowry who was recently appointed as Dep-

uty Chief of the Bureau of Medical Services, U. S. Public Health Service, Washington.

RETIRED

The following Commissioned Officers of the Public Health Service have been retired: J. Earl Miles, Senior Surgeon; Justina H. Hill, Sanitarian; and Arthur G. Malucky, Senior Dental Surgeon.

BOOKLETS

The Older Persons in the Home is a booklet which includes suggestions on furnishings and living arrangements, accident prevention, clothing, meal planning, recreation, and community aids. It also contains advice on sickrooms needs and the essentials of home care. Copies are 20¢ each and can be obtained from the Sup't. of Documents, Government Printing Office, Washington, D.C.

Veterans Administration

Chief Medical Director—WILLIAM S. MIDDLETON, M.D.

Deputy Chief Med. Dir.—R. A. WOLFORD, M.D.

NURSE RECRUITMENT

A campaign on a local basis to recruit nurses for the Veterans Administration hospitals has been launched to meet an urgent need. There is a critical shortage at the hospitals in Chicago, New York City, Los Angeles, and Ann Arbor, Mich. Part time or full-time nurses are needed.

Miscellaneous

MEETING

The Fifth International Congress of Internal Medicine will be held in Philadelphia, April 24-26, 1958. This is the first meeting of the Society to be held in this country. It is unlikely that another meeting will be held in this country for a decade. Many speakers

from this and foreign countries will be on the program. For further information address the Secretary-General, Edward R. Loveland, 4200 Pine Street, Philadelphia 4, Pa.

MEETING

The Fifth International Congress on Diseases of the Chest, sponsored by the American College of Chest Physicians, will be held in Tokyo, Japan, September 7-11, 1958. The Congress will be presented under the Patronage of the Government of Japan and the Japan Science Council, and has been endorsed by the Japan Medical Association.

Further information may be obtained from: Dr. Jo Ono, Secretary General, School of Medicine, Keio University, 35, Shinanomachi, Shinjuku, Tokyo, Japan; or Executive Director, American College of Chest Physicians, 112 East Chestnut St., Chicago 11, Ill.

MEETING

The American Association of Medical Record Librarians will hold its 30th annual meeting at Hotel Statler, Boston, Mass., October 13-16, 1958.

MEETING

The National Society for Crippled Children and Adults will hold its annual convention at Hotel Statler in Dallas, Texas, November 16-20. Headquarters for this society (the Easter Seal Society) are at 11 South LaSalle St., Chicago 3, Ill.

SCHOOL OF ALCOHOL STUDIES

Yale University will hold a *Summer School of Alcohol Studies* June 29-July 29. Further information may be obtained by writing to: The Registrar, 52 Hillhouse Ave., Yale Station, New Haven, Conn.

FREE BOOKLET

Clinical Norms is a 27-page book that is available to medical school deans and instructors of clinical nursing upon applica-

tion to the Lakeside Laboratories, Inc., Milwaukee, Wis.

This publication includes many facts used in the evaluations of laboratory tests and clinical diagnoses of various conditions. Values for certain electrolytes are expressed in terms of milligrams per cent and as milliequivalents.

BETTER MENTAL HEALTH

The Report of the 1957 National Health Forum, *Steps for Today Toward Better Mental Health*, is now available in a 128-page paper cover book at \$1.50 per copy. Orders should be directed to the National Health Council, Inc., 1790 Broadway, New York 19, N.Y.

BOOKLET AVAILABLE

Careers in Atomic Energy is a new booklet which describes job opportunities and training programs in the field of atomic energy. The booklet is available at 25¢ per copy from the Superintendent of Documents, Government Printing Office, Washington 25, D.C.

GOVERNMENT PUBLICATION

Med. Dep't. USA—Surgery WWII—

Orthopedics	\$4.00
#D 104.11:Su 7/6	
Safety for Household75
#C 13.4:463	
First Aid60
#I 28.16:F 51/2/953	
Housing for Elderly15
#HH 2.2:H 81/7	
Prenatal Care15
#FS 3.209:4/2	
Infant Care15
#FS 3.209:8/3	

Above may be obtained from the Superintendent of Documents, Gov't. Printing Office, Washington, D.C.

WHO PUBLICATIONS

World Dir. of Med. Schools	\$5.00
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Onchocerciasis and Filariasis	2.00
Cholera Studies; Sanitary Engin.	2.00
Communicable Diseases	2.00
Prev. of Rheumatic Fever30
Tech. Report No. 126	
Accidents in Childhood30
Tech. Report No. 118	

The above are obtainable from IDS, Columbia Univ. Press, 2960 Broadway, New York 27, N.Y.

EXERCISE

Early man, a hunter, walked an average of 20 miles a day, according to anthropologist Robert Briffault.

The Gallup Poll, in a survey made two years ago, concluded that the average North American walks a fraction less than two miles a day.

Howard O'Hagen, *Maclean's Toronto*

WATER

In an ancient village the average person could get along with from 3 to 5 gallons of water each day. Now the situation has vastly changed. On a typical U. S. farm, or in a city or village household, the average American uses about 137 gallons of water each day. And water consumption in the U. S. is rising—at the rate of one gallon a day per person per year.

"Water—Our Wasted Resource"

Senior Scholastic

AUTOMOBILES

Commissioner C. D. Curtiss of the Bureau of Public Roads estimated that by 1965 there will be more than 80 million motor vehicles in the United States, and by 1975 he predicted 90 million will be in use. He pointed out that vehicle registration has risen from 3.6 million in 1916 to 65 million in 1956.

*Bulletin, Amer. Assoc.
Motor Vehicle Adm.*

O B I T U A R I E S

Rear Adm. George C. Thomas, U. S. Navy, Ret.

George Carroll Thomas, Medical Corps, U. S. Navy, Retired, died at his home at Chevy Chase, Maryland, on November 17, 1957 at the age of 76.

Admiral Thomas was a native of Pennsylvania. He was a graduate of the Philadelphia College of Pharmacy and received his medical degree from the Jefferson Medical College in 1906. The following year he entered the Navy Medical Corps. During World War I, he served at the submarine base in New London, Conn., and later aboard a Dutch mission ship at Rotterdam. From 1924-1926 he served with the 1st Marine Brigade in Haiti. He commanded several Naval hospitals one of which was the U. S. Naval Hospital in Washington which at the time of his command was located at Twenty-third Street and Constitution Avenue, N.W.

He was appointed a rear admiral in June

1943 at which time he was medical officer for the San Diego Naval District. He continued on the active after his retirement in 1944, and served in the Bureau of Medicine and Surgery, until relieved from active duty in April 1946.

Admiral Thomas received a letter of commendation from the Secretary of the Navy. He held the Marine Corps Expeditionary Medal with bronze star, the American Defense Service Medal, the American Campaign Medal and the World War II Victory Medal. He was a fellow of the American Medical Association, the American College of Physicians, and was a life member of the Association of Military Surgeons of the United States.

He is survived by his widow, Mrs. Bertha Thomas, 3504 Leland Street, Chevy Chase, Maryland; a daughter, Mrs. Clarence M. Young; and two sons, George C. Thomas, Jr., and Ogden Thomas.

Interment was in Arlington National Cemetery.

NEW BOOKS

Books may be ordered through the Association.

- Operative Obstetrics*, by R. Gordon Douglas and William B. Stromme, Appleton-Century-Crofts, Inc., New York, N.Y.
- General Techniques of Hypnotism*, by Andre M. Weitzenhoffer, Ph.D. Grune & Stratton, New York, N.Y. Price \$11.50.
- The Gynecological Management of Urologic Injuries*, by Henry C. Falk, M.D., F.A.C.S. F. A. Davis Co., Philadelphia, Pa. Price \$7.50.
- Dangerous Properties of Industrial Materials*, by N. Irving Sax. Reinhold Publishing Corporation, New York, N.Y. Price \$19.50 till end of December; \$22.50 beginning January, 1958.
- Hepatitis Frontiers*. Henry Ford Hospital International Symposium. Editors: Frank W. Hartman, M.D., Gerald A. LoGrippe, M.D., John G. Mateer, M.D. and James Barron, M.D. Little, Brown & Co., Boston, Mass. Price \$12.50.
- Introduction to Anesthesia. The Principles of Safe Practice*, by Robert D. Dripps, M.D., James E. Eckenhoff, M.D., and Leroy D. Vandam, M.D. W. B. Saunders Co., Philadelphia, Pa. Price \$4.75.
- The Story of Peptic Ulcer*, Conceived by: Richard D. Tonkin, M.D., F.R.C.P. Characterized by: Raymond Keith Heillier, F.R.S.A. W. B. Saunders Co., Philadelphia, Pa. Price \$2.25.
- Laboratory Applications in Clinical Pediatrics*, by Irving J. Wolman, M.D. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N.Y. Price \$15.00.
- Roots of Modern Psychiatry*, by Mark D. Altschule, M.D. Grune & Stratton, Inc., New York, N.Y. Price \$5.75.
- Body Water in Man*, by Maurice B. Strauss, M.D. Medical Book Dept., Little, Brown & Co., Boston 6, Mass. Price \$7.00.
- Cardio-Charting: Universal Method of Recording Heart Auscultation*, by Arthur Brisker, M.D. The Macmillan Company, New York, N.Y. Price \$6.00.
- World Directory of Medical Schools*. World Health Organization, Geneva. Price \$5.00.
- Stedman's Medical Dictionary*. The Williams & Wilkins Co., Baltimore, Md. Price \$12.50.
- The Closed Treatment of Common Fractures*, by John Charnley, B.Sc., M.B., F.R.C.S. The Williams & Wilkins Co., Baltimore, Md. Price \$10.00.
- Practical Nursing Today. Attitudes, Knowledge, Skills*, by Margaret C. Esau, Barbara R. Fallon, Kathryn G. Frentzos, Elizabeth C. Phillips, and Eleanor A. Tourtillott. Edited by Cordelia W. Kelly. G. P. Putnam's Sons, New York, N.Y. Price \$5.95.
- Orthopedics for the General Practitioner*, by Wm. E. Kenney, M.D., and Carroll B. Larson, M.D., F.A.C.S. The C. V. Mosby Co., St. Louis, Mo. Price \$11.50.
- Allergy in Pediatric Practice*, by William B. Sherman, M.D., and Walter R. Kessler, M.D., Ph.D. The C. V. Mosby Co., St. Louis, Mo. Price \$9.25.
- Progress in Neurology and Psychiatry, An Annual Review, Vol. XII*. Edited by E. A. Spiegel, M.D. Grune & Stratton, New York, N.Y. Price \$12.00.
- The Physiologic Basis of Gastro-Intestinal Therapy*, by Heinrich Necheles, M.D., Ph.D., F.A.C.P., and Martin M. Kirshen, M.D., F.A.C.P. Grune & Stratton, Inc., New York, N.Y. Price \$8.75.
- Bone Diseases in Medical Practice*, by I. Snapper, M.D. Grune & Stratton, Inc., New York, N.Y. Price \$15.00.
- Der Seekrieg—The German Navy's Story 1939-1945*, by Vice Adm. Friedrich Ruge, U. S. Naval Institute, Annapolis, Md. Price \$5.00.
- Hormones in Blood—Ciba Foundation*, by Wolstenholme & Miller. Little, Brown & Co., Boston, Mass. Price \$9.00.
- The Healing of Wounds*, Edited by Martin B. Williamson, Ph.D., McGraw-Hill Book Co., Inc., New York 36, N.Y. Price \$7.00.
- Clinical Electrocardiography*, by Robert P. Grant, M.D., McGraw-Hill Book Co., Inc., New York 36, N.Y. Price \$7.50.
- Ophthalmology and Otolaryngology, Surgery in World War II*, by The Surgeon General, Department of the Army, Washington 25, D.C. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C. Price \$5.00 (Buckram).
- Modern Sex Life*, by Edwin W. Hirsch, M.D., Research Laboratories, Medical Arts Bldg., Chicago 1, Ill. Price \$0.35.
- Cardiovascular Rehabilitation*, Edited by White, Rusk, Williams & Lee, M.D. McGraw-Hill Book Co., Inc., New York, N.Y. Price \$6.50.
- Manual of Pharmaceutical Law*. 2nd edn., by Pettit, The Macmillan Co., New York, N.Y. Price \$4.50.
- Symposium on Diseases and Surgery of the Lens*, by Haik, The C. V. Mosby Co. Price \$10.50.

BOOK REVIEWS

THE INFECTIOUS DISEASES OF DOMESTIC ANIMALS. 3rd Ed. By William A. Hagan, D.V.M., D.Sc., Professor of Bacteriology and Dean of the Faculty, New York State Veterinary College; and Dorsey W. Bruner, D.V.M., Ph.D., Professor of Bacteriology, New York State Veterinary College, Cornell University. 968 pages, 171 figures. Cornell University Press, Ithaca, N.Y. 1957. Price \$10.50.

The third edition of this well known textbook represents an up-to-date résumé of information with respect to the infectious diseases of domestic animals.

Part I of this textbook, which discusses the mechanisms of infection and resistance, has been changed slightly from the second edition. A few of the more noteworthy discoveries have been included. The section on chemotherapeutic agents has been enlarged and now includes a discussion of the hazards of antibiotic treatment and combined chemotherapeutic agents.

Part III is a discussion of the pathogenic bacteria and their relationship to animal diseases. Although the information presented in this section of the textbook is not complete in so far as a bacteriologist might be concerned, it does give much valuable information as to the organisms and their identification. The information on the pathogenic bacteria has been summarized in a very excellent manner and presents the information concisely. Accompanying the discussion on the organisms themselves is a limited discussion of the disease entity produced by each. Information with respect to immunity produced by the organisms, the chemotherapy which may be utilized in treatment of the condition, and the relationship to human infections are discussed.

Part IV contains a discussion of the bacteria-like pathogenic organisms of uncertain classification and includes the rickettsial diseases, the spirochetal diseases, and diseases caused by the pleuropneumonia group.

An excellent discussion on the pathogenic fungi and many excellent illustrations are included in section V. A discussion of the pathogenic protozoa is included in Part VI. The description of viruses and virus diseases has been changed more perhaps than any other section of the textbook and included in the discussion of every virus disease are the properties of the virus itself, its cultivation by artificial methods, and in particular the use of

tissue cultures for the propagation of viruses.

This textbook is well written and is supplemented with exceptionally good illustrations. It should be of considerable value for both veterinary students and veterinary practitioners.

E. H. COLES, D.V.M.

SIGNS AND SYMPTOMS. Applied Pathologic Physiology and Clinical Interpretation, 3rd Ed. Edited by Cyril Mitchell MacBryde, A.B., M.D., F.A.C.P. 28 contributors. 973 pages, illustrated. J. B. Lippincott Company, Philadelphia and Montreal. 1957. Price \$12.00.

Signs and Symptoms is a text which should be a source of pride to Dr. MacBryde and his co-authors. Some thirty-four symptoms and signs are minutely analyzed by experienced clinicians who are keen observers, well grounded in the fundamentals of anatomy, physiology, and pathology. They represent the complaints of patients and are the reason why patients seek help from their physicians. Diagnoses established by the scientific analyzes presented in these chapters must of necessity be more exacting and lead to more logical and more satisfactory therapy.

The plan of discussion of each symptom and sign is outlined at the beginning of each chapter. Normal mechanisms, standards, and findings are presented, allowable variations are stressed, and the pathologic deviations therefrom are described clearly and concisely. Each chapter concludes with a clear cut summary and an extensive list of references. The illustrations, tables, and plates have been wisely chosen, are conveniently placed in the text, and are of superb teaching value.

This is the type of text which should serve as a "bible" to the physician who desires to practice modern scientific medicine. It is no wonder that besides this 3rd English edition, it has been translated into several foreign languages.

This book is an outstanding example of what well directed team work can produce. Dr. MacBryde has performed a splendid job of coordination. For the busy physician who wants to take a practical postgraduate course at home, here is the way for him to do so. This reviewer would like to see this book added to the medical libraries of all ships and stations so that medical officers stationed upon them could have readily available the modern thinking and logic of these 28 consultants.

CAPT. JULIAN LOVE, USN, RET.

PRACTICAL FORENSIC MEDICINE. By Francis E. Camps, M.D., Reader in Forensic Medicine (University of London) at The London Hospital Medical College; and W. B. Purchase, C.B.E., M.C., M.B., D.P.H., Barrister-at-Law. 541 pages, illustrated. The Macmillan Company, New York. 1957. Price \$13.50.

This book was written to give medical practitioners, lawyers and police officers a fair idea of what material entered into the study of Forensic Medicine. The text consists of three parts: Forensic Medicine, Toxicology, and Appendices.

Part I describes the various crimes and medical conditions for which the doctor is apt to be called professionally. Part II describes various poisons encountered with antidotes, with a short summary of the laws regulating the prescription and sale of poisons and dangerous drugs, and includes a list of dangerous household poisons and solvents. The last 80 pages of this part tabulates alphabetically 130 various drugs, fatal dosage, and postmortem findings.

Part III, Appendices, lists legislation concerning poisons, various useful blank forms, such as for operation, death certificates, etc., with a glossary of medical terms.

The legal aspects of this book, while pertinent in England, are of limited value to American practitioners. The medical aspects of the book are a useful reference source.

COL. EDWARD A. COATES, JR., USA, RET.

CLUES TO SUICIDE. Edited by Edwin S. Shneidman, Ph.D., and Norman L. Farberow, Ph.D. 19 contributors. Forward by Karl A. Menninger, M.D. 227 pages. The Blakiston Division, McGraw-Hill Book Company, Inc., New York, Toronto, London. 1957. Price \$5.50.

This book is an accumulation of nineteen contributors and discusses an extremely important problem. As pointed out by Dr. Karl Menninger in his Foreword, at least every minute someone in the United States either kills himself or tries to kill himself. Unfortunately, this book does not contain a chapter on the importance of suicide in the Armed Services.

On page 56 it is stated, "Birth is an uncontrolled event but the manner of one's departure from life may bear a definite relation to one's philosophy of life and death. Man's behavior may be influenced more than we assume by his outlook and hopes and fears regarding the nature and meaning of death. We would indeed err grievously to consider death as a purely biologic event. Its meaning for the individual can serve as an important organizing principle in determining how he conducts himself in life, including his attitudes toward taking his own life. Death may never assume for us the role it

did for medieval man to whom it represented the beginning of a moment infinitely more important than the moment of birth—but it is an area of meaning which requires and demands broader and deeper investigation."

This book is divided into two sections, the first part composed of nine chapters, discusses "Theoretical and Experimental Considerations." The second part, composed of nine chapters, takes up "Clinical Considerations." In the final chapter there is an accumulation of suicide notes which are well worthy of review.

As a beginning point this book is worthy of study. It is hoped that the book will encourage members of the Armed Services to really investigate the motivation for suicide.

CDR. JAMES L. MCCARTNEY, MC, USNR, RET.

THE TREATMENT OF FRACTURES. Vol. II. By Lorenz Bohler, M.D., Director of the Accident Hospital, Vienna XX; Professor of Accident Surgery, University of Vienna. Translated by Otto Russe, M.D., and R. G. B. Bjornson, M.D. 435 pages, 931 illustrations. Grune & Stratton, New York and London. Price \$17.50.

This is the second of three volumes which will constitute the Fifth English Edition of this classic work on fracture treatment. This volume is considerably smaller than the first and deals with the fractures and dislocations of the hip, pelvis, femoral neck and femoral shaft.

Bohler's avowed purpose is to present a detailed exposition of his methods to avoid the misinterpretation that he has observed in his travels. He seems to have succeeded in this but in so doing he has compiled a work that is tedious reading and leaves nothing whatsoever to the imagination. The treatment advocated is generally quite conservative. He devotes an extensive section of the book to treatment of fractures of the femoral shaft on the Bohler frame, a technique that is rarely used in most centers in this country. Only ten pages are given to the indications, technique and complications of intramedullary fixation.

The binding and paper are good; the illustrations, especially the reproductions of x-rays, are excellent. The three volume set will have its greatest usefulness in medical libraries. It should be available for reference by all who are treating trauma.

CDR. WILLIAM S. STRYKER, MC, USN

A MANUAL OF PHARMACOLOGY. 8th Ed. Torald Sollmann, M.D., Professor Emeritus of Pharmacology and Materia Medica, School of Medicine, Western Reserve University, 1535 pages. W. B. Saunders Company, Philadelphia and London. 1957. Price \$20.00.

The appearance of this 8th edition of Sollmann

arouses nostalgia; his first edition appeared in 1917, or 40 years ago. Most of the leaders in pharmacology in the United States grew up with the earlier editions, and it would appear that this is the pioneer textbook in American Pharmacology by a single author.

Comparing this with earlier editions, we find that the "complexities of modern pharmacology—the actions and uses of drugs" are still presented in the pattern which has proven successful. Ordinary type presents a summary of the accepted actions of a drug or group of products, supplemented by additional (often controversial) matter in smaller type. In this way it is possible to hasten through any particular section and learn the consensus of modern opinion, then go over the presentation more slowly to get all of the details which appear pertinent. The general plan has been repeated; plant constituents, pharmacy, prescription writing, weights and measures and general information on the administration of drugs, with a side-glance at toxicology. Sollmann continues his earlier limit of a poison as a substance capable of destroying life or seriously endangering health in doses up to 50 grams internally, which is much larger than the usual concept.

The medicinal foods and vitamins are discussed, then protectives, irritants, war gases, drugs, acting in the gastrointestinal tract, then those acting on the nervous systems, and on the muscles. Allergic phenomena, hormones, cardiac drugs, are followed by those affecting temperature and analgesia. The antibiotics are discussed then narcotics and anesthetics. This is followed by a consideration of the organic and inorganic substances of medicinal or toxicological importance.

Each subject as discussed is approached through its historical background, organic chemistry, principal pharmacological and clinical actions on the various systems, and pertinent information on assays, followed by a discussion of preparations and posology.

It is amazing how much information is concentrated in this book. Discussions range from the use of digitalis and other crude drugs from the beginning of recorded history up to the relationship between smoking cigarettes and development of lung cancer. Many references were noted to literature published in 1956. The bibliography of almost one hundred and fifty pages, in two

columns, summarizes papers appearing since January 1940. Papers published previously may be identified by reference to the earlier editions. It is hoped that in the publication of the 9th edition, arrangements may be made to publish the entire bibliography as a separate volume, perhaps, so that all of this will be available to the user.

There is a competent 25 page index which seems to cover the contents thoroughly. It is felt that the old-timers will only need to know that "here is another edition of Sollmann" for their teaching and reference use; and that the newcomers in this field will get acquainted with this standard reference as they conduct any research problem.

JAMES C. MUNCH

METHODOLOGY OF THE STUDY OF AGEING. Ciba Foundation. Colloquia on Ageing. Vol. 3. Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch.; and Cecilia M. O'Connor, B.Sc. 202 pages, with 47 illustrations. Little, Brown and Company, Boston. 1957. Price \$6.50.

This is the third volume reporting on the subject of ageing and is devoted to the technics used in studying the subject. There are twenty-eight authors, and, as the chairman states in the foreword: "There are many groups, in different countries, studying the subject of gerontology. . . . We all realize that we are studying variations with time in what we think is normal function."

Professor A. T. Welford of Cambridge University states: "Motivation among older subjects does not seem to be a serious problem. The bewildering complexity of human capacity can, at least to a considerable extent, be sorted out. Various background factors affecting the comparability of subjects of different ages can be controlled." While Professor Irving Lorge of Columbia University states: "As more and more information about ageing becomes available, it becomes clearer and clearer that the interpretation of the evidence depends upon the methodology utilized and upon the assumptions underlying it." At the end of this small volume is a general discussion which in a way summarizes the foregoing papers.

Anyone interested in the problem of geriatrics, whether from the physical or psychological approach, will find this book well worth the reading. CMDR. JAMES L. MCCARTNEY, MC, USNR, RET.



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